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# FOOD INDUSTRIES

NATIONAL EDITION

● FOR THOSE WHO CONTROL QUALITY THROUGH MANAGEMENT AND PRODUCTION

Four-station unit weighs and bags potatoes

OCTOBER 1947

Continuous French Frying Operation

Slaughter House "Tough Jobs"

Baking With Sweet Potato Flour

Swiss Cheese Made By Electricity

Developing New Food Specialties

Filtration Yields More Peach Juice

Improved Packaging Devices Save Labor

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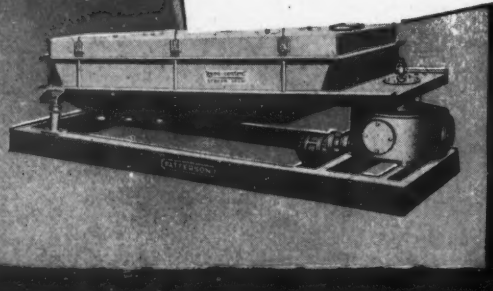

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# FOOD INDUSTRIES

FOR THOSE WHO CONTROL QUALITY THROUGH MANAGEMENT AND PRODUCTION

OCTOBER, 1947 Volume 19, Number 10



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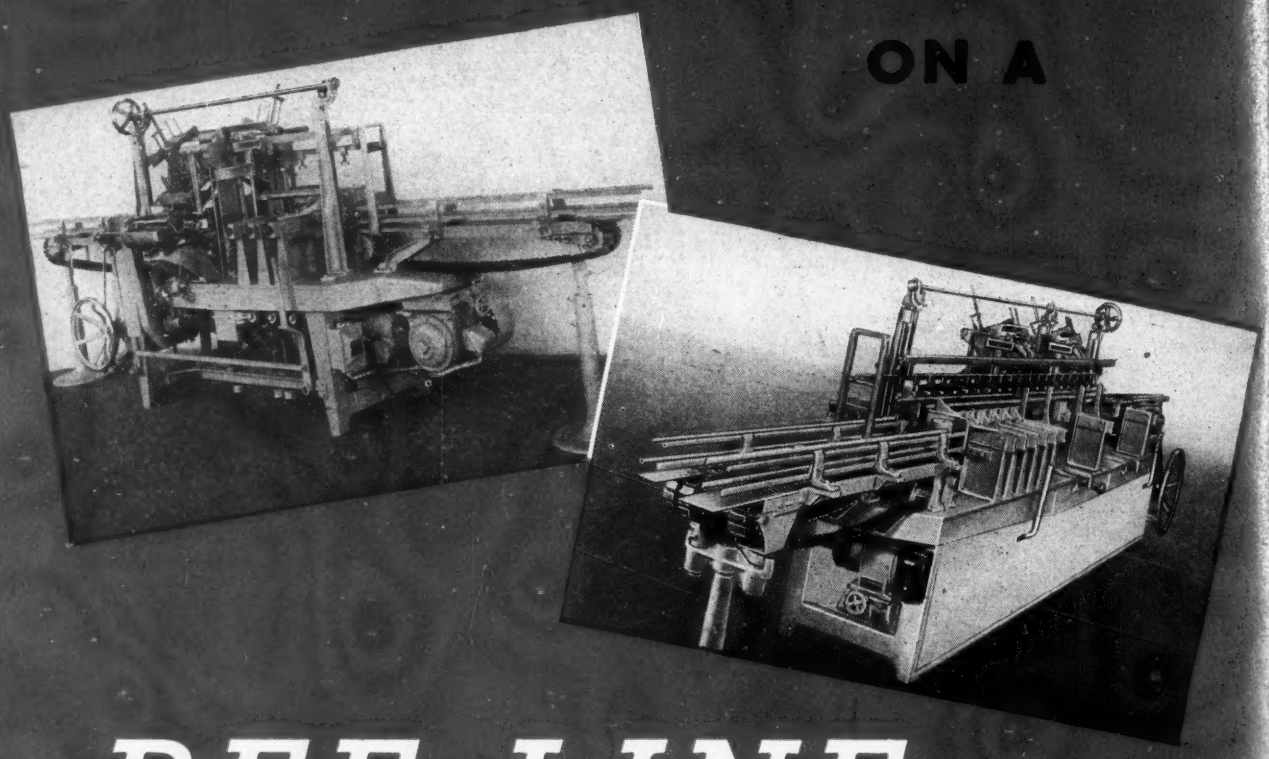
# PUT YOUR GLASS PACKED PRODUCTS ON A



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# Our Stake in British Recovery

MANY executives who operate companies having only regional distribution are wont to regard the shortage of dollars abroad as of no concern to them. The argument runs that, having no export business, the international situation is a problem for the other fellow.

The cumulative effect of such short-sighted opinions by many thousands of business men could have a bad influence on Congress.

At one time Britain exported enough coal to pay for its food imports. Recently Britain has been importing coal and food. It paid for purchases in the U.S.A. by borrowed dollars. They're about all spent now.

### Must Import 30 Percent of Its Food

Britain can produce enough food for only 70 percent of its people. Vast areas of poor British soil are suitable only for pasturage, for the top soil is often only 2 inches deep. If Britain cannot buy food for the remaining 30 percent of its people by exports or further borrowing, then its future is grim, indeed.

The only alternatives to further borrowing, appear to be increased production and exports, or emigration of 30 percent of the people, or slow starvation.

If Britain can produce enough coal the problem will be nearly solved. But until the British income tax law is so changed that it provides an incentive to work, instead of to loaf after the first five days of the work week, little improvement is expected. The difficulty seems to lie in the income tax assessment on a weekly basis instead of an annual basis. Any pay beyond the basic work week is nearly all taken by taxes. So why work longer?

Unfortunately, public attitudes and laws do not change quickly in Britain. So one would expect emigration rather than sound production incentives.

### It's Emigrate or Work!

The temper of the people is growing ugly because of continued austerity. A political upheaval may throw the Socialists out. Nevertheless only work—not abandoning Socialism—will solve the food problem.

Emigration would be mainly to the British dominions. Some of them are actively seeking white immigrants, especially Australia that hopes for 15 millions.

Before World War I, Britain used to "export" about 200,000 persons a year to its dominions. The dole removed the need for emigration to find work and its population has accumulated beyond Britain's capacity to feed.

If 30 percent of Britain's 50,000,000 people should migrate most of them would become food producers instead of food consumers. In 10 years, 15,000,000 younger persons could migrate to food producing areas. Certainly, they would not be expected to seek food in deficit regions. How soon the augmented population of world food surplus areas would affect the economy of the U.S. is anybody's guess.

### Payrolls Determine Sales Volume

It is true there is not enough food in the world. Also, what food there is, is not distributed uniformly. The problem of paying for it from certain surplus areas is still unsolved despite all the efforts of the Food and Agriculture Organization. A decline of U. S. exports, whether food materials or manufactured goods, will affect our payrolls in general. And payrolls are the key to the prosperity of secondary food processors—the makers of fabricated foods in contrast to primary food processors—except possibly bread bakers.

Confectioners, specialty food makers, carbonated beverage makers and the whole gamut of the food processing industries that normally were never concerned with international trade will need to be close observers of world affairs.

We in the U.S.A. must abandon our localized thinking and realize that our nation is a part of the world—not merely a part of a continent.

### Long Range Repercussions

To believe that anything farther away than a 200 mile radius is of no concern is folly. Unless British coal miners really mine coal in a big way —and soon—some ten years hence, this country may feel important repercussions. What form they may take cannot be discerned today. But it seems dead certain that a Britain with only 35,000,000 instead of 50,000,000 persons, and Australia with 20,000,000 up from 7,000,000 and New Zealand with 2,000,000, and Canada with 20,000,00 will be a vastly different place for doing business than we ever knew it before.

The Marshall Plan, now under active discussion, embraces this and much more. But, whether or not we aid Europe, the food problem in Britain will be important to us.

We have an important stake in Britain's recovery—not for sentimental reasons—but for very practical, even selfish reasons.

H. V. Burton

EDITOR

# The Talk of the Industry

● IT seems as if the reputation of our ability to predict the future has gotten completely out of hand. A chap recently telephoned clear across the country to ask for a forecast of 1950 production!

● HOW short is the memory of man! In the spring of 1947 we ran across an old notebook in which were jotted the remarks of Leon Henderson back in 1944. Or was it Chester Bowles?

"A decline in food prices is expected in mid-1945. If prices stay down from 4 to 6 months, O.P.A. will pull off the ceiling prices."

● U. S. farm population is about 3,000,000 less than its prewar size, a loss of 9.8 percent from 1940. Farm population is now about 27,500,000 persons, up from the wartime low of 25,200,000 in January, 1945. This means that one person on the farm feeds more than five persons in cities, plus whatever food we export, less our imports. For practical calculations, however, the 1 to 5 ratio is handy. About 20 years ago it was 1 to 4. The present situation does not augur well for lowered food costs when export demand ceases. The fewer producers can exercise better control. But it does suggest that agricultural prosperity will be more enduring and that national prosperity will benefit thereby.

● EXPLOSION of a bottle of beer, injuring the eye of a grocery clerk, led to a damage suit against the brewer. A city court awarded $500 damages. On appeal the judgment sustained the lower court, but a higher court reversed the decisions below: No evidence of neglect.

Bottle explosions are queer things. They do not always occur in pressure ware. We have known what approximated an explosion in a milk bottle. The bottle shattered into bits from the heat of a woman's hand.

● APPARENTLY one must register as a paid lobbyist in Wisconsin if one dares to talk to a legislator in that state. John B. Newman of Corn Industries Research Foundation answered technical questions from the Agricultural Committee about the use of dextrose and inadvertently violated the law. He was fined $250.

● RETAIL sales of preserved foods must be shaded a bit when calculating the sales volume of certain items. An unrevealed factor that could be misleading is consumer purchases of overseas parcels to friends in hungry nations. A recent report from the U. S. Post Office can be interpreted that such shipments by parcel post amount to a huge volume of food, bought chiefly at retail, but not consumed in this country.

Outgoing foreign mail from New York that handles 85 percent of transatlantic mail was up 700 percent in December 1946 over December 1938. The second quarter of 1947 was up 17 percent over the corresponding period in 1946, and the acceleration is increasing. Parcel post accounts for 87 percent of the volume, the largest recipient being Germany.

The New York post office requires 3,337 persons to handle the foreign mail as compared to 745 in January 1939. Biggest single shipment to date was 73,000 sacks on May 29.

How much is food and how much textiles and other non-foods is anybody's guess, but if half is food and if the average were 50,000 sacks at 100 lb. each it would mean 25 tons of food a day, or about 400 minimum carloads a year, of which flour, sugar, canned meats, chocolate and other highly concentrated foods are large items.

If the outward flow were to stop suddenly it might cause some sales managers to wonder what had happened.

There is little likelihood, however, for anything short of another war to stop it, and as Europe's condition deteriorates this obscure export may increase materially unless our own inflation acts as a deterrent on such purchases.

# Hors d'Oeuvres

● Farm Journal reports the renting of bee colonies by Ohio fruit growers as an economical way of insuring a good crop. Says the "bees should be in the orchard far enough in advance of blooming to allow them to get acquainted with the place." A budding orchard is no place for a homesick bee, evidently.

● *Now that "The Ice Cream Song" is with us, you can expect any day to hear it teamed with "Yes, We Have No Bananas" and "The Peanut Vendor" in a banana split medley.*

● Australia National Airways claims an ideal recipe for "flying sponge cake." It retains its moisture and freshness through thousands of miles of travel at reasonable altitudes, they say. Seems like a lot of trouble to go to just to eat sponge cake.

● *Up in Vancouver, an exterminator traps male rats by playing the recorded mating squeaks of female rats, according to Electronic Markets. It isn't easy for us to work up sympathy for a rat, but this does it.*

● A Chicago novelty manufacturer is getting set to produce 100,000,000 beer can openers to supply the increased demand. This should leave no excuse for the children to be constantly running to mother.

● *That ice cube gravy and mashed sweet potatoes with orange juice, reported by Cornell's frozen food investigators, leaves us a little rocky. But then we are looking at it from the point of view of the label printer.*

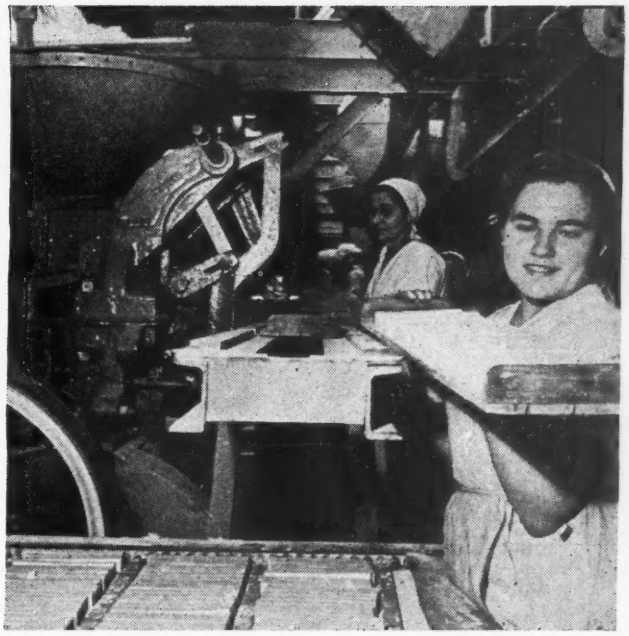
● Bert Nevins, who publicizes the donut industry, is annoyed at the dictionaries that define both crullers and his product as just fried cake. Crullers are long or twisted, he says, and donuts are little with a hole in the middle. Sort of makes you want to crush something, doesn't it?

● *Wine consumption, in 1946, increased by 50 percent over 1945, according to the Department of Commerce. Distilled spirits were up 20 percent, while beer consumption dropped slightly. Shows you how serious a grain shortage can be.*

● Remember that stuff they canned in separate compartments of the same package and dropped over Nagasaki and Hiroshima. Well, the Can Manufacturers Institute reports wieners and barbecue sauce being put up the same way. Only there is no fission until the can is opened. There are other differences, too.

● *Remember the lake 75 mi. long, 150 ft. wide, and 31 ft. deep that Borden's said could be filled with a year's supply of milk. They've altered it to take care of last year's supply. It's now a river 3,530 mi. long, 40 ft. wide and 2½ ft. deep. Much safer not to make it so deep.* J.A.J.J.

SUGAR BEET plantings were increased by 400 acres this year.



A NEW TECHNIC in refining adds 300 lb. per ton of juice.

# Russia Plans To Eat

## New developments in food processing and the continuing struggle to increase grain, fruit and vegetable production are beginning to show results

**Based on News Reports from Robert Magidoff**
**McGraw-Hill World News Moscow Bureau**
**Pictures from Sovfoto**

THE Soviet food industry is looked upon as being on the threshold of a new and promising stage in its turbulent career. An intense urgency is apparent in all sectors of food production, whether it be increases in vital crops or in the equally vital food processing. Nowhere is this better demonstrated than in Russia's beet sugar industry.

In addition to increasing plantings by 400,000 acres over last year, the Soviets claim a new technic in the refining of beet sugar, which eliminates the byproduct treacle and extracts an additional 330 lb. of sugar per ton of processed sugar beet juice.

The technical details of the method are not disclosed, but it is said to "correct the error of Achard," who invented the basic process still widely utilized for sugar beet refining, after 150 years. This new method, invented by the engineer, A. B. Fremel, is oriented on the sugar content of the beet juice rather than on the nonsugar elements. It is reported to reclaim the 20 percent loss sustained under previous refining processes.

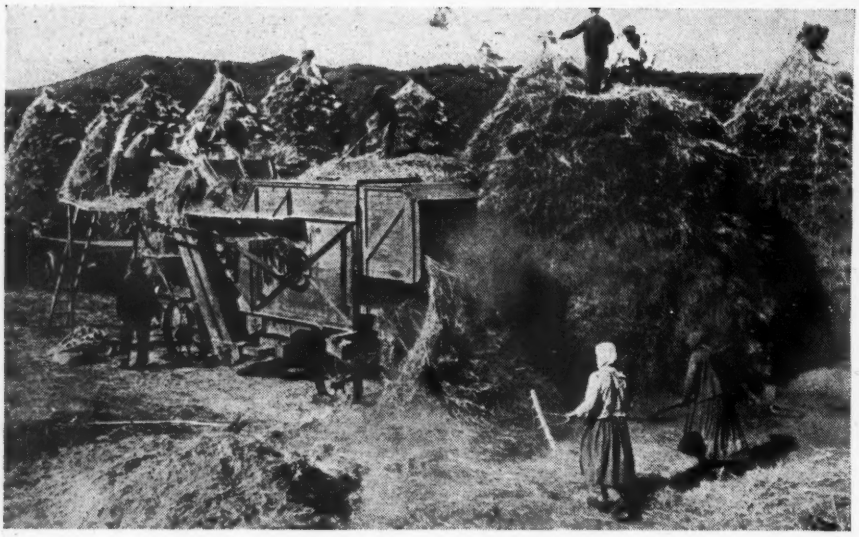
The new technic is also said to be capable of yielding "hundreds of thousands of tons" of mineral fertilizers as byproducts, by means of evaporation installations at sugar refineries. These minerals, nitrogen, phosphorus, potassium and other chemicals are deposted in the precipitations in the process, which has been tested at the Kharkov Technological Institute and described as 100 percent efficient.

### Not Used

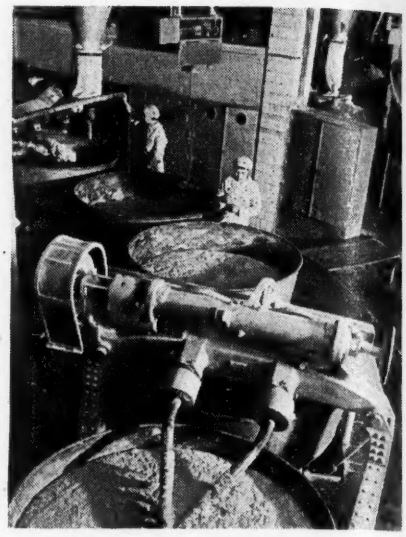
Prospects of early widespread application of the new process are not bright, however, because the method involves radical departures from existing refining processes. Soviet press criticism has been directed at the Institute for continuing to design sugar refining plants along traditional lines and neglecting to develop refineries based on the new process. The Institute's reply is that the new process is "too expensive" and is still subject to study by Soviet experts.

Another development in food processing is the report of a new method of making powdered milk. Experts of the Moscow Scientific Research Institute of the Dairy Industry have been drying the milk by means of a special disk revolving at great speed in a special apparatus filled with heated air. Liquid milk, poured uninterruptedly on this disk, breaks up into fine particles, which dry instantly and settle on the bottom as powder.

In the vegetable fats and oils industry, pressure is being applied to bring up lagging production. In the words of the minister of food industry, Vassily Zotov, this industry "owes a great debt to the state and it must pay up in the period between May and October." To assist in the "payment," new plants for the extraction of fats and oils are being launched at seven or eight strategic points. These are being equipped with modern machinery and are to use new extraction



THE WHEAT CROP results from an all-out Soviet effort, with organization of work in the fields, at machine tractor stations, and on farms far more efficient than since 1940.



BAKERY and flour production are due to rise, with bumper wheat crops in sight.

CANNING problems are probably more serious than those of any other food branch, due partly to shortage of containers.

CREAMERIES, with their transportation problems, may soon get relief from what is claimed to be a new milk drying method.

methods, which are calculated to eliminate 50 percent of the present losses and to increase oil production by about 2 percent in relation to the weight of the seeds.

Particularly important advances are planned for the production of margarine. This industry is earmarked for a fourfold increase between 1947 and 1950 with the aid of 39 margarine producing plants scheduled for construction during that period. Four new plants are to be completed this year. In addition, the Gomel fats combinat is to be completed and the capacities of the Kharkov and Yevdakov combinats are to be expanded.

The problems facing the canning industry are probably more serious than those of any other branch of the Soviet food picture. In the first place, production of vegetables has deteriorated because of wartime damage to hothouses and to irrigation systems. There have also been insufficient quantities of fertilizer. Added to these is the shortage of tin cans and glass jars. During January of this year, for instance, shortages of soda and of fuel compelled the glass factories to fall behind schedules by several million jars. Even so, the industry is scheduled to increase production by at least 10 percent over 1946, particularly in tomatoes and other vegetables.

### Frozen Foods

Production of frozen fruits and vegetables is in full swing at three processing plants in Moscow. Among these is the recently restored Mikoyan Preserving Combinat. Berries and vegetables are quick-frozen at these plants within two hours after harvesting. After cleaning they are wrapped in Cellophane and packed in cardboard boxes, which are sealed with paraffin wrapping paper. The packages are placed in metal containers, which are then deposited in refrigerating chambers for from 2 to 2½ hours at temperatures from –22 to –31 deg. F. They are then delivered by refrigerated trucks to Moscow's refrigerating plant, where they are stored until released for sale in late fall and winter.

These frozen foods are said to include strawberries, currants, plums, melons, green peas, corn, wax beans and mixed vegetables. An estimated capacity of "several hundred tons"

BREAD RATIONING may end this fall. Greater variety as well as greater quantity are anticipated by the Russian leaders.

FRUIT AND VEGETABLE output is getting close attention. These strawberries are for one of Moscow's three freezing plants.

ORCHARDS are being developed with the ultimate objective of raising per capita fruit consumption to equal that in the U. S.

SUNFLOWERS loom large in the sagging fats and oils industry, where production is winning some frowns from officials.

per season is given for one of the three plants in operation.

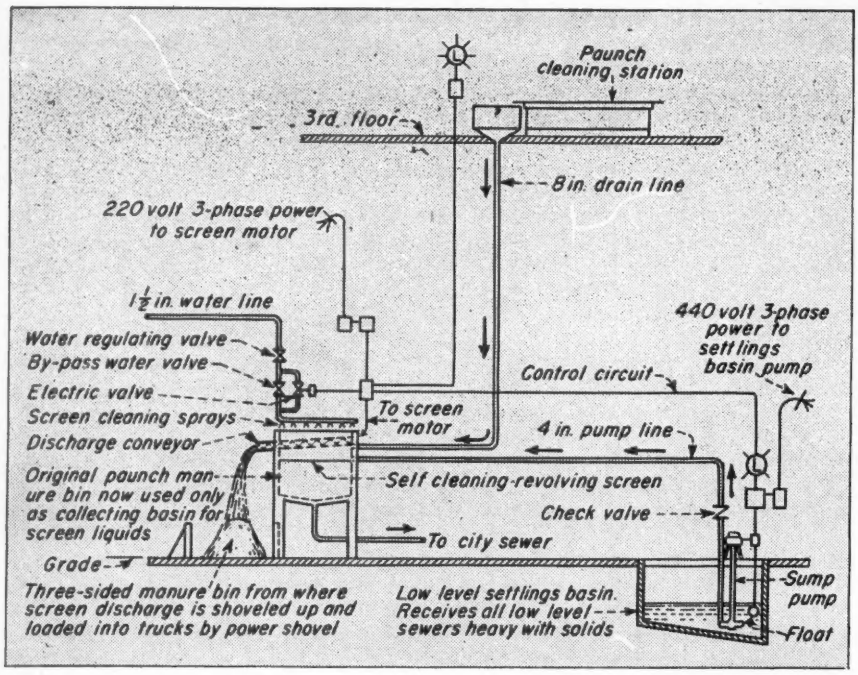
One of the great offensives, however, continues to be in crop increases. Grain production, for instance, is expected to result in the elimination of bread rationing this fall. The prospects for a bumper crop were reported as good to excellent by the Soviet press as this was being written. Organization of the work in the fields by machine tractor stations and by collective farms is incomparably more efficient than at any time since 1940. And the attention paid to this aspect of the country's economy by the Soviet government and the Communist party is likewise closer and more demanding. Throughout Russia's agricultural areas, the struggle is on against losses in the fields due to possible wet weather, lack of equipment, transport, or fuel. The men and women working on the harvest are given close attention. Not only are these workers serviced by mobile kitchens, but mobile stores and even musical instruments are provided to brighten up the little leisure time they can manage.

### Other Crops

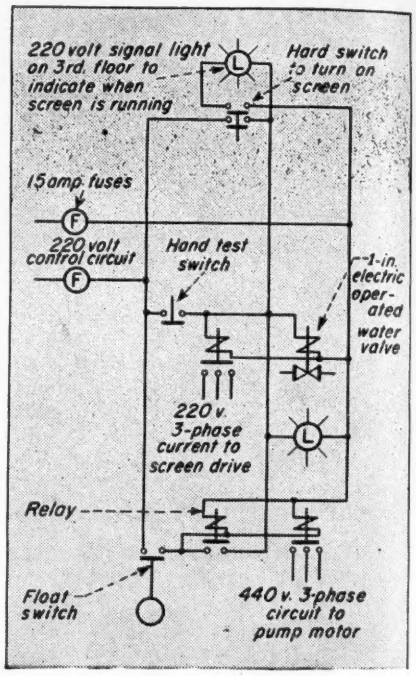
Bumper crops in other raw materials are also expected and these involve a terrific effort by the entire Soviet food industry. Because of war damage they are not yet equipped to take care of all the foodstuffs that are being grown this year. The industry finds itself in a position similar to that of the second five year plan, when in the face of an enormous increase in crops the industry had to concentrate on the construction of sugar refineries, meat and canning combinats, bread plants, and the like. In addition, of course, these plants had to be equipped and personnel trained to operate the machinery.

Side by side with these general efforts, the Russian Soviet Republic, largest of the union's 16 republics, recently announced a program for the planting of 212,000 acres of orchards and 77,000 acres of berry plots during the next four years.

One-half the nursery output is scheduled for sale to collective farmers, office and factory workers for the planting of private fruit bearing plots. The remainder will be utilized to found fruit plantations at collective and state farms.


Paunch cleaning station
3rd. floor
8 in. drain line
220 volt 3-phase power to screen motor
1½ in. water line
Water regulating valve
By-pass water valve
Electric valve
Screen cleaning sprays
Discharge conveyor
Original paunch manure bin now used only as collecting basin for screen liquids
Grade
Three-sided manure bin from where screen discharge is shoveled up and loaded into trucks by power shovel
To screen motor
440 volt 3-phase power to settlings basin pump
Control circuit
4 in. pump line
Self cleaning revolving screen
Check valve
To city sewer
Low level settlings basin. Receives all low level sewers heavy with solids
Sump pump
Float

**FLOW DIAGRAM** shows improved method of handling paunch manure and catch basin settlings at the meat packing plant of Frye & Company, Seattle, Wash.


220 volt signal light on 3rd. floor to indicate when screen is running
Hand switch to turn on screen
15 amp. fuses
220 volt control circuit
Hand test switch
1-in. electric operated water valve
220 v. 3-phase current to screen drive
Relay
Float switch
440 v. 3-phase circuit to pump motor

**WIRING DIAGRAM** showing controls required to operate dewatering system.

# Slaughter House "Tough Jobs"

**Many unsavory jobs are encountered by maintenance men in meat packing plants. Others necessitate working under extremely difficult conditions**

By RALPH WALTER, Mechanical Supervisor, Frye & Company, Seattle, Wash.

ONE of the really "Tough Jobs" around a slaughter house is the disposal of paunch manure. In our new plant the paunch manure was washed down from the third floor, by a special sewer line, into a large concrete pit. A perforated metal plate was provided in one side of the pit to allow the excess water to drain off into the plant sewer. Settlings were removed by hand through a valved opening in the bottom.

We found that the holes in the perforated plate soon plugged up with straw and manure, causing the bin to overflow and creating a very unsanitary condition. Baffles were installed, but these were only partially successful in preventing the clogging.

Not only was the perforated plate inadequate as a separating screen, but the job of opening the large valve in the bottom of the bin and raking the manure into a truck at the end of each day's work was very laborious.

## Screen Installed

The separating and bin emptying problems were solved simultaneously by the installation of a revolving, self-cleaning screen over which pass paunch manure and settlings from the plant sewer catch basin. The screen permits liquids to pass through and into the sewage system. A conveyor removes the solids and deposits them on a concrete platform with three sides. Solids are picked up daily with a power shovel and loaded into a truck for disposal. The same shovel is used to clean the stock pens.

## Sewer Catch Basin

Another messy, disagreeable job, usually requiring overtime or Sunday work at premium wages, was the removal of settlings from the plant sewer catch basins.

These basins must of necessity be located at a low point in the plant layout. It is, therefore, quite difficult to remove the settlings unless some type of mechanical apparatus is provided.

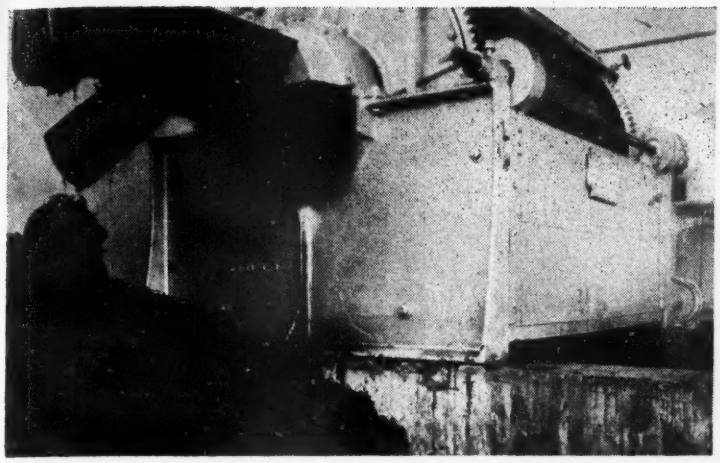
At our plant, which is rather small, no mechanical equipment was provided, and we had to clean the catch basins by hand.

This difficulty was overcome by installing a standard, open running centrifugal sewage pump, with the runner set very close to the bottom at the low point in the catch basin. The pump now picks up all the settlings and discharges them into the revolving, self-cleaning screen described above.

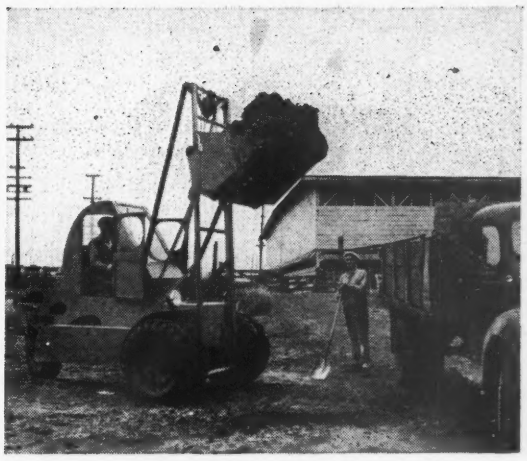
## Special Wiring

To make sure that the revolving screen and attached water sprays, for cleaning the screen, were operated when needed and shut off

**This is the second of the prize winning articles on "Tough Jobs" around a food plant. Ralph Walter's article, describing how he overcame a number of such jobs in a meat packing plant, wins one of the $100 prizes. Other "Tough Job" articles will be printed from time to time.—The Tough Job Editor.**



REVOLVING SELF-CLEANING SCREEN strains out the solid manure and discharges it into bin (foreground). Liquids pass out bottom to sewer.



POWER SHOVEL is used for the daily removal of solids from pit. Solids are transported to nearby farms.

when not required, a somewhat involved electric wiring system was necessary.

The pump at the catch basin is operated by a float switch. It might, therefore, come on at any time, day or night. The manure from the paunch cleaning operation is washed down only during the day, when cattle are being slaughtered.

By a system of relays, properly interlocked with the motor controls, the revolving screen and water cleaning sprays are made to come on whenever a catch basin pump starts. By the use of a conveniently located manual switch and signal light, the operator who runs the paunch cleaning operation can turn on the revolving screen whenever needed. Each control operates independently.

By taking the control circuit power off the screen operating motor circuit, a failure here will automatically stop the sump pump.

### Preventing Clogged Sewers

The sewers in any plant are not the nicest things to work on or clean out, but in a slaughter house they are terrible. Our plant is new and the latest type of floor drains were installed, consisting of a 9½ in. square cast iron basket with ½ in. holes in the bottom, covered with a 11 in. square floor grating containing 1 x 1¾ in. slots.

As all kinds of litter fall on the floor in a packing plant, including pieces of skin, bits of meat and fat, bits of bone, patches of hair, congealed blood, and the like, the cast iron baskets soon became clogged. When the basket clogged up and the water would not go down the drain, the first thing the workman did was to lift off the cover and remove the basket. This action, of course, permitted all the litter to go down the open drain.

Instructions were issued that this was not the proper way to clean the basket, but as the workmen on the floor did not have to clean the stopped up drains, the instruction did little good.

We naturally had a great deal of trouble from this cause. As the clean-up men worked late at night, we often had to call out our maintenance men on double time to unstop the sewers.

The trouble was solved in this manner:

1. We removed and discarded all the cast iron baskets.
2. Then we spot brazed the cast iron cover plate right to the floor section, making it impossible for employees to remove them.

Now, if the cover plate clogs up, all a man has to do is run a broom over the plate, or flush with a hose, to remove the accumulation, and the drain will function again. Anything that will pass through the slots in the cover plate will pass on out the sewer.

This idea has saved us a lot of clogged sewers and eliminated the special calls and overtime work.

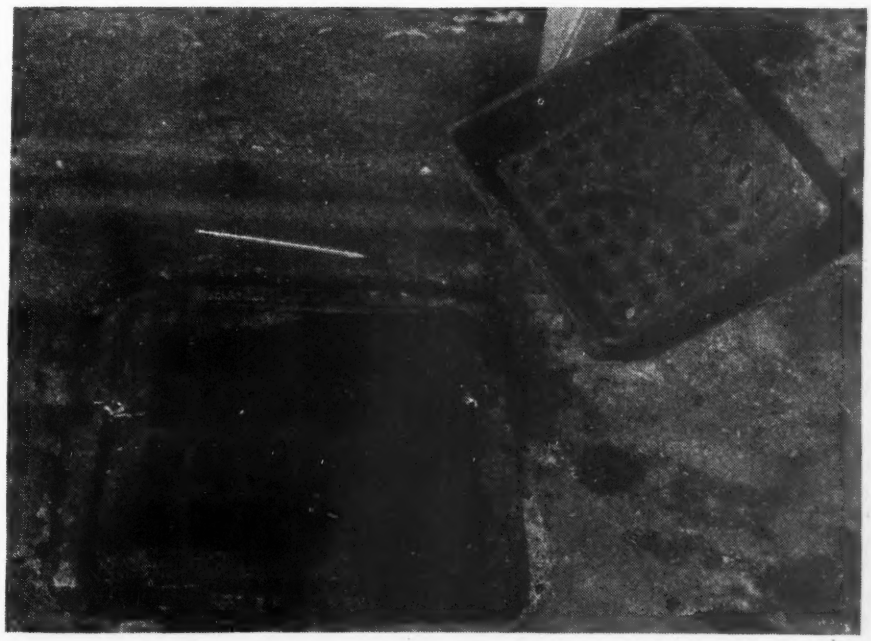
The spot brazing can be easily broken loose with a pinch bar if at any time it is necessary to remove the drain cover.

### Eliminating Rusty Coils

A different type of "Tough Job" was encountered in the meat curing brine storage tanks. The brine, principally salt and a few other ingredients dissolved in water, is kept in large vats at a constant temperature. The temperature is maintained by ammonia refrigeration coils in direct contact with the brine.

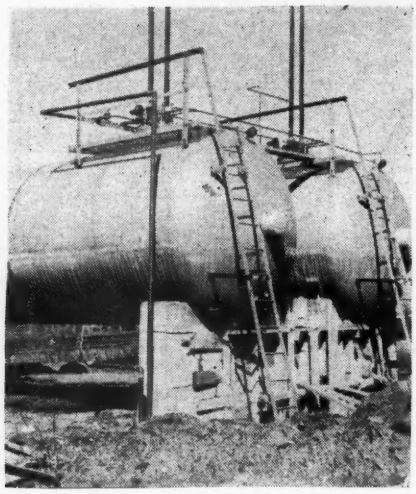
Galvanized pipe isn't very satis-

(*Continued on page* 210)

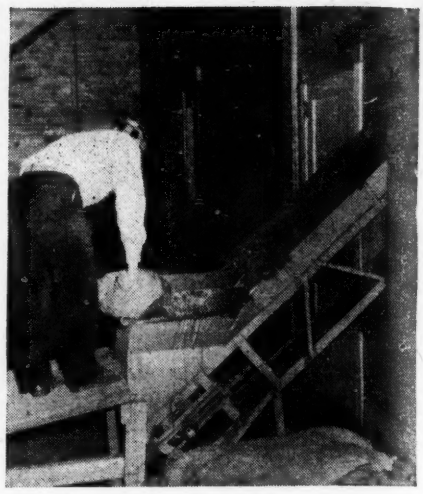


CLOGGED SEWERS were eliminated when the drain baskets, which clogged easily, were removed and cover plates spot brazed in place to prevent removal by janitors.

**1.** NEW PLANT built in scarcity days at Corinna, Maine. Stacks carry off smoke from frying machines. Steam comes from blancher.



**2.** TO GET GAS to fire the fryers Baxter's put in a propane system with storage tanks 2,500 feet from plant. Ice often forms on tanks as liquid evaporates.



**3.** LONG BEFORE potatoes are dumped into elevating conveyor they have been stored at proper temperatures to keep down their sugar content.

# Continuous Frying Under

## This is as ingenious a job of continuous process development and equipment

**FOOD INDUSTRIES Staff Report**

H. C. BAXTER & BRO. needed to develop a continuous automatic frying machine to have economic production when they entered the business of manufacture of frozen French fried potatoes at Corinna, Maine. They had to do other things, too, such as build a new plant at a time when it was exceptionally difficult to procure the necessary materials. It was necessary to pipe potable water from an intake far up a stream above a number of intermediate factories, such as textile mills. They did this by laying a pipe on the stream bed itself. Also they had to provide themselves with gas in a town where there was no gas. They put in a propane system, buying the liquified gas by tank cars and laying 2,500 ft. of 2-in. pipe underground. They had to work up a by-product—mashed potatoes—about which nobody knew much in an industrial way.

It took well over a year to do all this, but finally they succeeded and now have a continuous process for the production of French fried potatoes and mashed potatoes, both of which are distributed in frozen form under the Birds Eye label. All the preliminary work that led to the design of the continuous fryer was done by Baxter's own research and development department. By careful work with rather simple apparatus, such as the Pitco Friolator, a small restaurant type potato fryer made by J. C. Pitman & Sons, of Lynn, Mass., enough data was acquired to engineer the design of the continuous frying operation.

### Frying—A 2-Stage Operation

Since the frying is the outstanding development of this particular operation, let's discuss it first. The process involves two-stage frying of the washed, blanched slices. The first-stage frying is at medium temperature, turning out a potato that is cooked but not browned. It could be browned completely by leaving it in the hot fat many minutes longer, but better results are obtained by using a second stage at higher temperature.

One of the problems of designing the continuous fryer was that of the most economical use of fat. This end has been approached by various ingenious methods. The potatoes are conveyed through the fryers in perforated buckets carried on an endless chain. Heat is furnished by gas. It was the opinion of many that it was impossible to use a gas flame to heat fat for continuous deep fat frying. Baxter disagreed. They went ahead, did it, and it works beautifully.

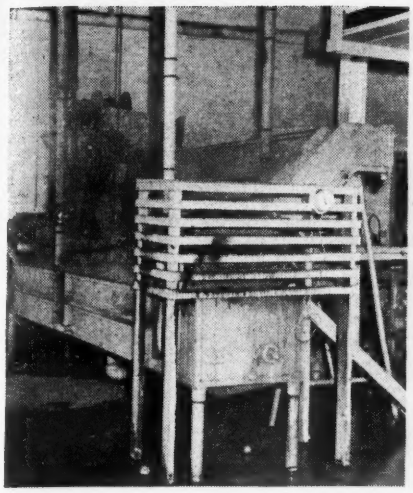
In order to take the hot smoke from the frying tanks out of the factory, each fryer is covered with a hood leading to an exhaust duct that draws the fumes outdoors.

### Continuous Clarification of the Fat

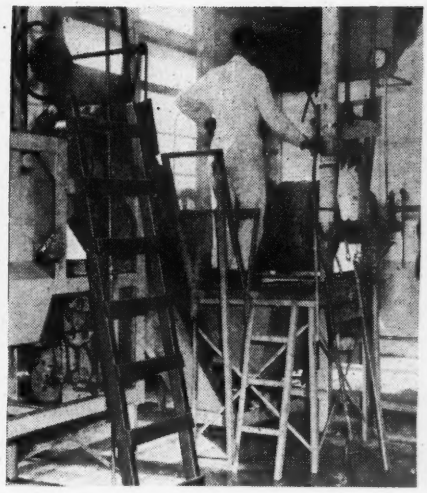
As is well known to anyone who has had any experience in frying, particles of food will come off and carbonize, thereby producing black specks that may lodge on the product. Therefore, it is necessary to clarify the hot fat continuously. At the Corinna plant this is done by passing the hot oil through a continuous centrifuge where any carbonaceous matter is deposited on the center of the bowl. The centrifugal separator they use was designed for milk separation but, since the proper type was unobtainable, they went ahead and used what they could get. In fact, to get the factory ready for the 1947 run, it was necessary to cannibalize and rob several other seasonal Baxter plants of all manner of equipment.

### Temperature Control

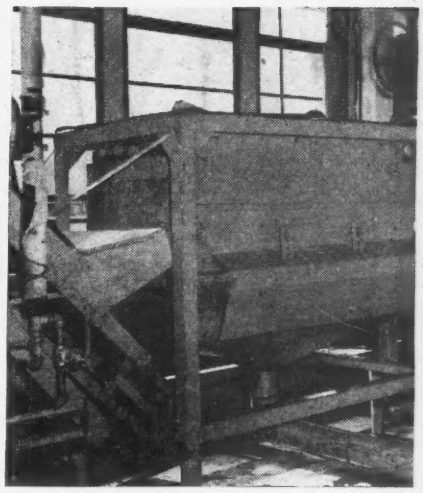
Temperature control throughout the frying operation is so important that the gadgets necessary for its accomplishment are numerous and as complex as would be found on an automatic pressure boiler. When the plant was first put into operation there was considerable apprehension about what would occur if electric power should fail. Here was the problem: With the frying oil at high temperatures not



**4.** ROCK TRAP FLUME, above, discharges over a rod screen to warm water treatment below to avoid pink or gray discoloration of potatoes.



**5.** P-B CONTOUR PEELER first heats potatoes with live steam at 100 psi., for about 1 minute, to cook a very thin layer. This is a continuous batch operation.



**6.** NEXT STEP in peeling is to pass the potatoes from Step 5 over peeling rolls under water spray in this housing. This operation is truly continuous.

# Full Automatic Control

## design as ever came to our attention. Scrap material became new byproduct

too far removed from the flash point, and the cold potatoes ceasing to enter the frying bath, might the latent heat in the fire boxes cause the oil to burst into flame?

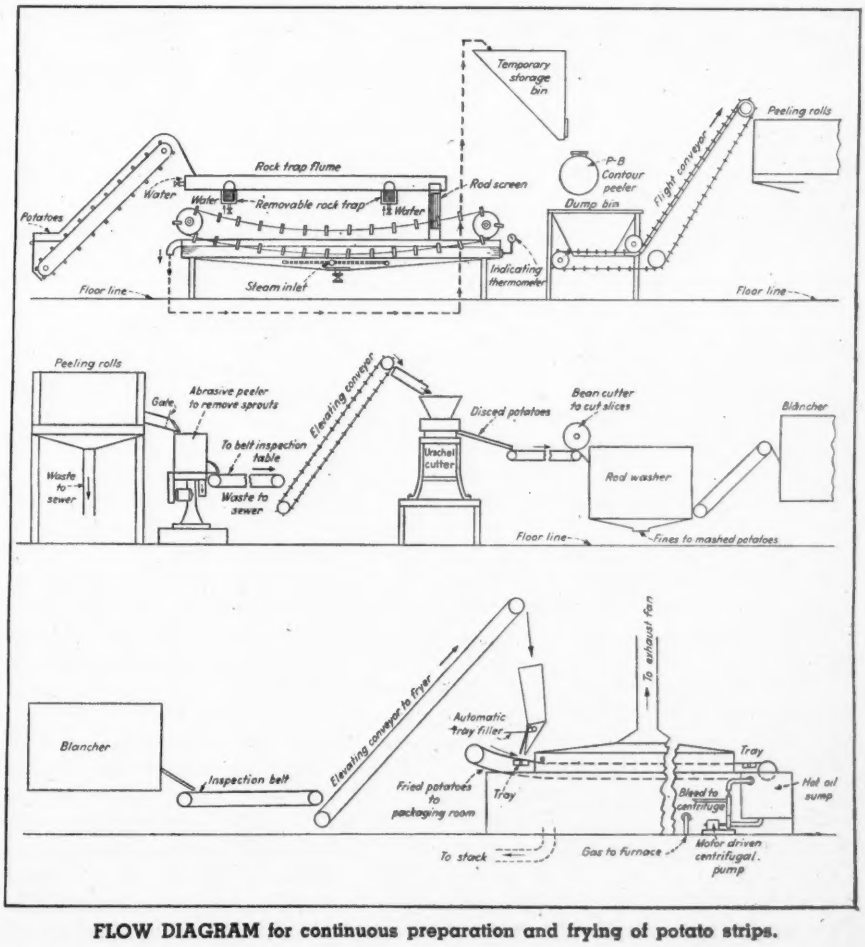
Rather than await such an unpleasant experience, the whole matter was tested out purposely. It was found that the temperature went up only about 15° above the operating point. The safety devices are so constructed that they shut off the gas automatically if the power goes off and the fire boxes were so constructed that the latent heat was not sufficient to cause any real trouble. While the whole setup is considered to be fool-proof, the company takes no chances and never leaves the fryers unattended.

### Loading and Unloading the Fryers

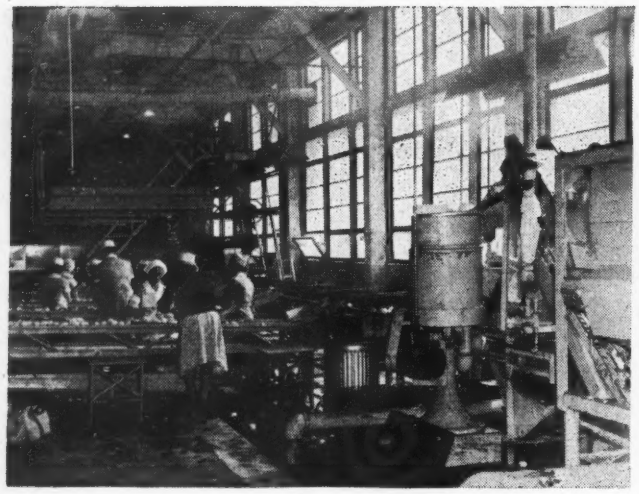
Loading and unloading the fryers is fully automatic, being actuated by cam operated trippers. This device represents real inventive ingenuity. In fact, the whole plant is a departure from tradition and is typical of what trained food technologists can do when given a problem in which there is no prior art to follow.

There are two first stage fryers, both of which discharge into the feed of the second-stage fryer. Except for the necessary attendants, for safety's sake, no manual operations are needed.

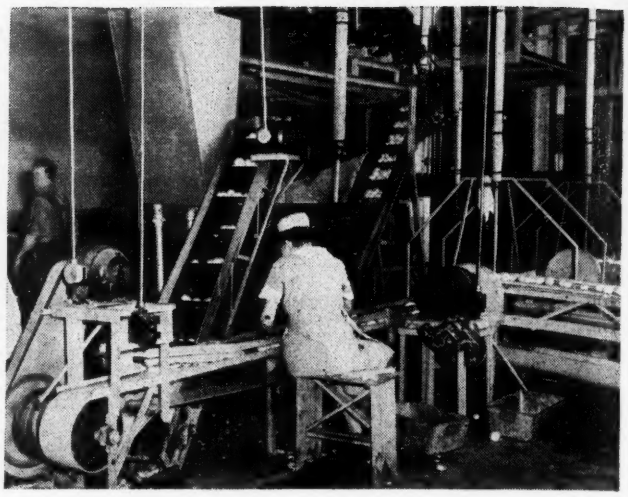
During the war Baxter's had been operating a potato dehydrating plant and had thus acquired considerable experience with potatoes. During that period O. P. Pierson and Walter Boynton of the engineering department had developed



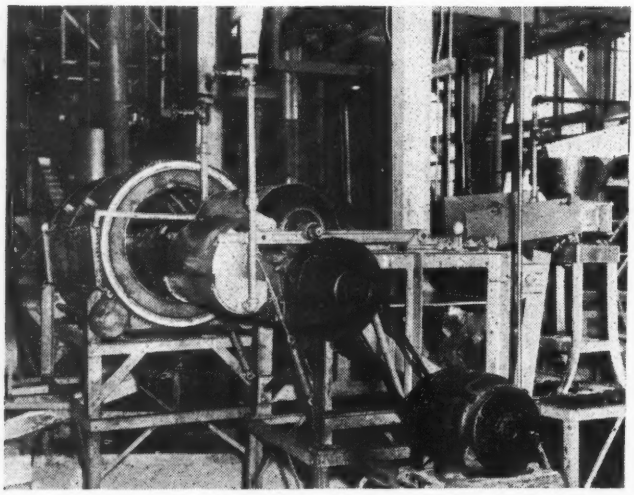

**FLOW DIAGRAM** for continuous preparation and frying of potato strips.



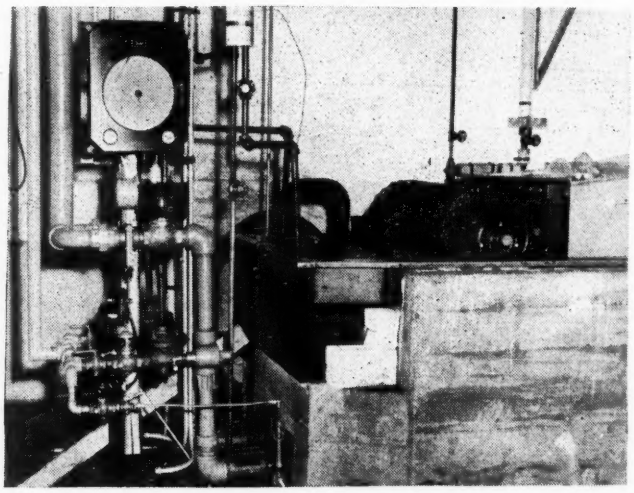
7. TO REMOVE sprouts automatically the peeled potatoes pass through abrasive peeler (right), thence to inspectors (left).



8. FINAL INSPECTION of peeled stock before going into temporary water storage—a surge point.



9. SLICING POTATOES into discs, right; cutting discs into strips, center; separating strips from fines by rotary rod washer, left. Next step is blanching.



10. PROPANE GAS firing of continuous fryer requires elaborate and accurate controls both for technological and for safety reasons because hot fat is fairly near to the flash point.

a steam potato peeler now being made by Pfaudler Co., known as the P-B Contour Peeler. That machine has been put into use in the preparation line. It is preceded, however, by a rock trap flume, shown in the flow diagram, that catches the occasional stone in the potatoes. The three jets of water keep things moving and this water is separated by a rod screen just before the potatoes enter the warm water treatment.

Quality control starts with the raw potatoes in the storage warehouses. Considerably higher storage temperatures than are customary in ordinary commercial storage are maintained. The purpose is to keep down the sugar content of the potatoes which normally increases slowly at temperatures just above freezing. Warm storage keeps the sugar content more nearly uniform than does cold storage. Certain types of raw stock cannot be safely stored at such high temperatures; warm storage encourages storage diseases as well as excessive sprouting, so the storage problem is a difficult one which requires constant watchfulness.

### Cutting the Slices

Slicing the peeled potatoes is done automatically in a two-stage operation. First the spuds are sliced and then the slices are cut into strips by an old French style bean slicer. This produces a sizable percentage of fine material in addition to the desired strips.

Separation of this fine material is done automatically by use of a rotary rod washer. Small stuff slips between the rods, is dewatered, inspected and cooked for mash potatoes—a byproduct. The French fry strips are then blanched and go to a final inspection belt, thence to the fryers, and finally to the packaging room. Packaging is the one operation that has not yet been fully mechanized, but in another season it is expected that automatic filling and weighing will be achieved.

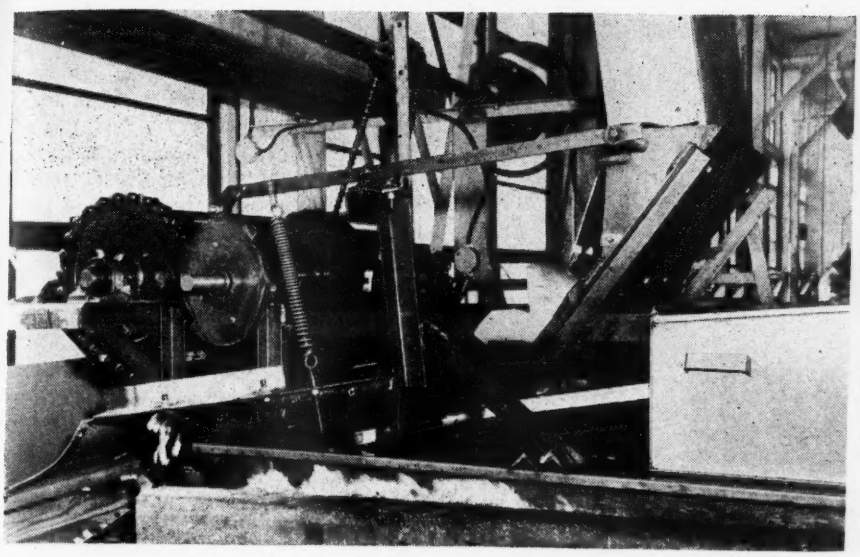
### Mashed Potatoes

Since it is impossible to cut circular discs into strips without producing a few small cuts or fines, the problem arose as to what to do with them. Baxter converts them into mashed potatoes.

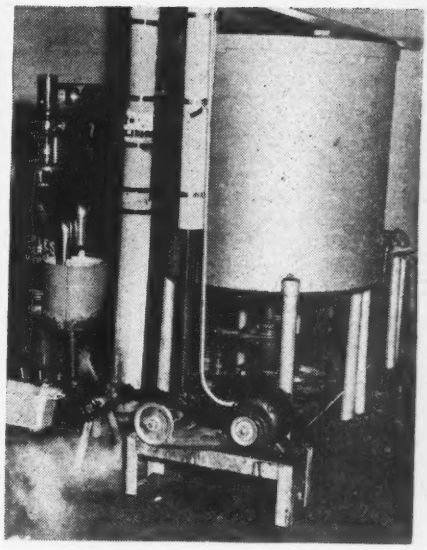
A product as white as mashed potatoes must be absolutely free from any discoloration, so another inspection is required. Next the fines are given a continuous steam cook, after which they are mashed in a power driven masher, filled into packages and frozen. Filling is a hand operation and remains to be mechanized.

### Quality Control

Warm storage of the raw potatoes is the principal feature of the first step in quality control, but many detailed records are kept, such as variety, field where grown, type of soil, topography, previous history of the land, fertilizer used, and name of the grower. Nothing is left to conjecture should any un-



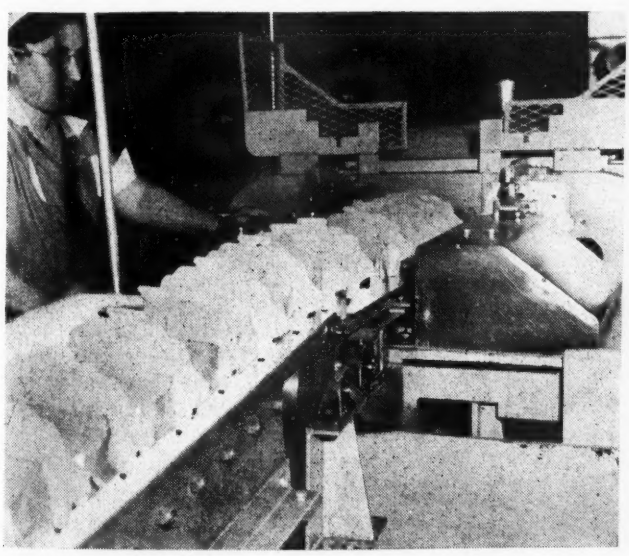
**11.** DETAIL OF CAM-OPERATED DUMPER that feeds blanched slices into perforated trays on top flight of conveyor chain. Trays containing fried slices on lower flight dump automatically on conveyor at left. This conveyor is made from woven wire cloth for two reasons: 1, It is not injured by fat; and 2, It permits drainage of adhering hot liquid fat.



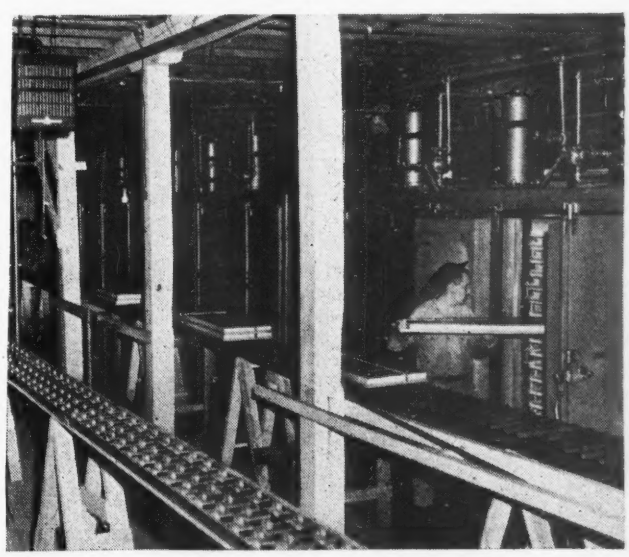
**12.** TO AVOID unsightly black specks from carbonized starch particles the hot fat is continuously clarified in a centrifugal separator, then returned to the fryers. Tanks are for temporary storage.

**13.** AIR COOLED fried slices are conveyed to three filling lines where girls hand-fill cartons.

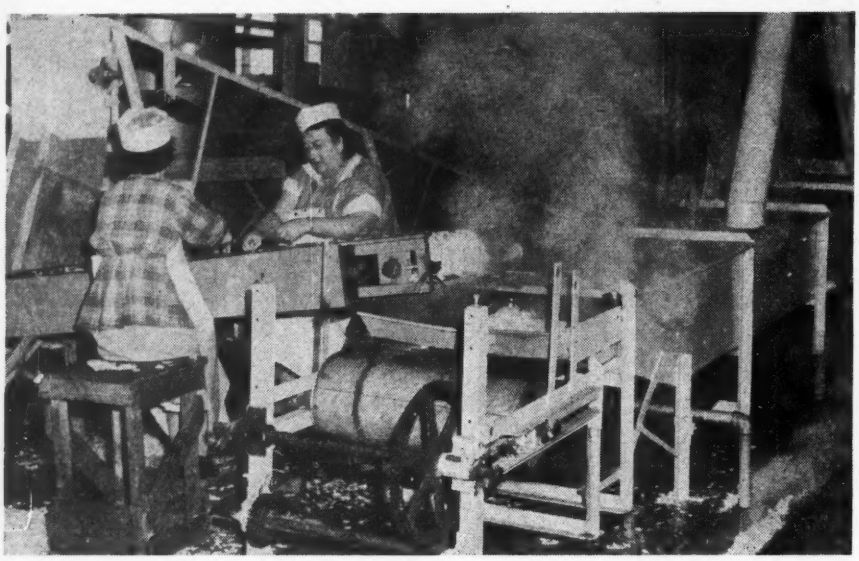
**14.** EACH PACKAGE must be check weighed before cartons are closed and wrapped.



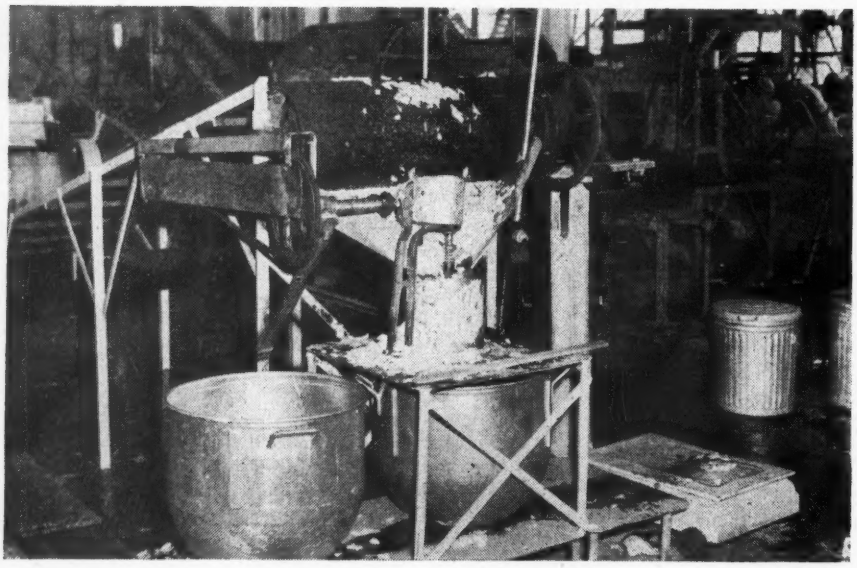
**15.** FILLED CARTONS go to automatic carton closing and wrapping machines, thence to another building.



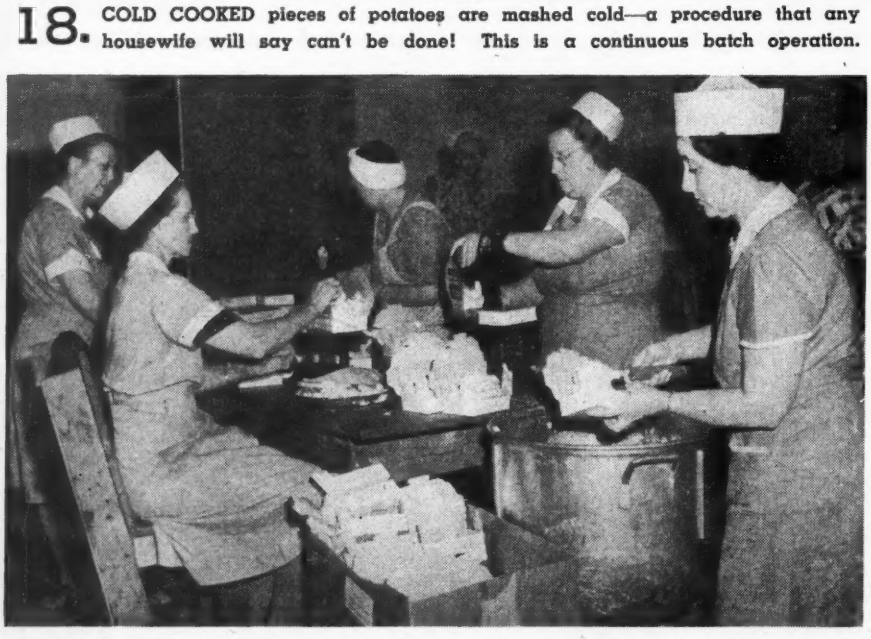
**16.** LOADING Birdseye multiplate freezers. There is a battery of ammonia compressors in this building.



**17.** FROZEN mashed potatoes are made from fines from Step 9. After inspection, fine pieces pass through steam cooker, right, thence through chilling spray.



**18.** COLD COOKED pieces of potatoes are mashed cold—a procedure that any housewife will say can't be done! This is a continuous batch operation.



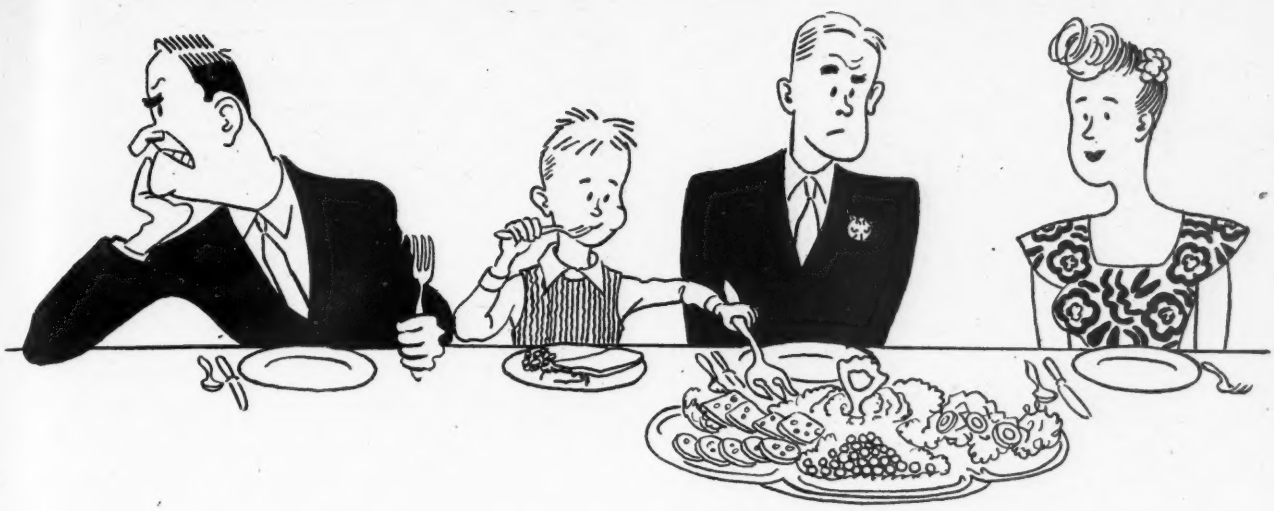
**19.** FILLING AND PACKAGING cold mashed potatoes is a hand job. Some day it will be mechanized, but this crew of five women keeps pace with production.

expected results arise. Moreover, at the plant a sample of each incoming lot of potatoes is tested for the amount of reducing sugars present.

Five degrees of variations of raw material are recognized and defined in the production specifications. Lots showing variations beyond the limit for French fries are sold for direct consumption. This season about 20 percent of the potatoes purchased for the test operation were sold for other uses.

Another quality control function in this plant is hourly inspection of all the important factors that go to make up a good quality product. Quality control at the Corinna, Maine, plant is carried out by a quality control man assisted by a woman quality control inspector. Normally she is the one who does the routine hourly inspection. If any feature of the operation varies from the specified methods, she reports that fact immediately to the man in charge of quality control. He verifies her report by a personal inspection. Then he goes to the superintendent of the plant with a request to correct whatever may be wrong. The quality control supervisor's authority is such that he has the power to shut down the entire operation pending a conference with the staff of the production manager's office.

The man in charge of quality control also works in the laboratory making the routine analytical tests that may be necessary. But, in addition to the foregoing, because the company has a contract with Birds Eye-Snider for the packing of the frozen French fried potatoes and frozen mashed potatoes under the Birds Eye label, the buyer has a representative at all times in the plant. He also inspects all operations regularly. Samples are taken frequently, some of which go to the Birds Eye-Snider laboratories; others are examined by the Birds Eye local field representative and by Baxter's quality control man. Routine samples are taken every hour for the regular inspection of grades by the quality control department. The last package of every day's run is tested for determination of bacterial build-up that may have occurred during the day. French fries usually have a very low bacterial count, being practically sterile. To be any other way after cooking in such hot fat is difficult to imagine. Mashed potatoes naturally run a little higher in bacterial count, but vigorous bacterial control is successful in keeping them well below the danger point.



# War Food Aversions Were Not Confined to GI's

**Veterans' dislikes for certain foods are not so enduring as those of the civilians. Civilians, therefore, are the bigger problem. Prewar quality must be equaled or exceeded, now that competition has returned**

By WILL A. FOSTER, Vice-President, The Borden Cheese Co., New York

THE eating habits of Americans are undergoing a postwar reconversion. The wartime restrictions caused some food aversions or dislikes for certain foods to develop among the civilian population. These aversions are now affecting food buying.

The basic foods that people like are influenced by many factors. Chief among these are racial origin, geographical origin and religious or medically prescribed restrictions. As people grow older, their tastes for foods may lean more towards those with pronounced or hearty flavors.

### Hot and Cold

During the war years, frequent mention was heard about the "likes" and "dislikes" for certain foods, which were developing among men in the service. Predictions were freely made that no veteran would ever eat cold luncheon meats again after his battle with the K-ration kits.

Today a fair appraisal would indicate that servicemen returned with fewer food dislikes than had been predicted, while the civilian population here at home developed some pronounced ones during the domestic rationing.

Of necessity, soldiers in every war may eat foods for which they do not care. Hardtack was the butt of jokes of the Union army for years! Veterans of World War I had their fill of beans, prunes, oatmeal, bread pudding and goldfish.

In World War II, men who served in the American armies had a wider variety of tasty, wholesome food than the men of any previous war. The Quartermaster Corps did noble work with food processors in this development. Hot foods were served as close to troops in combat as was physically possible. The ability of the Navy to maintain refrigeration aboard ship gave most sailors better foods than many of them enjoyed at home.

Veterans who poked fun at cold luncheon meats and swapped them for cigarettes had an aversion to such meats when eaten *cold*. Back in civilian life they do not have the same degree of dislike when these foods are served *hot*, and topped with catsup or a bit of cheese for added flavor.

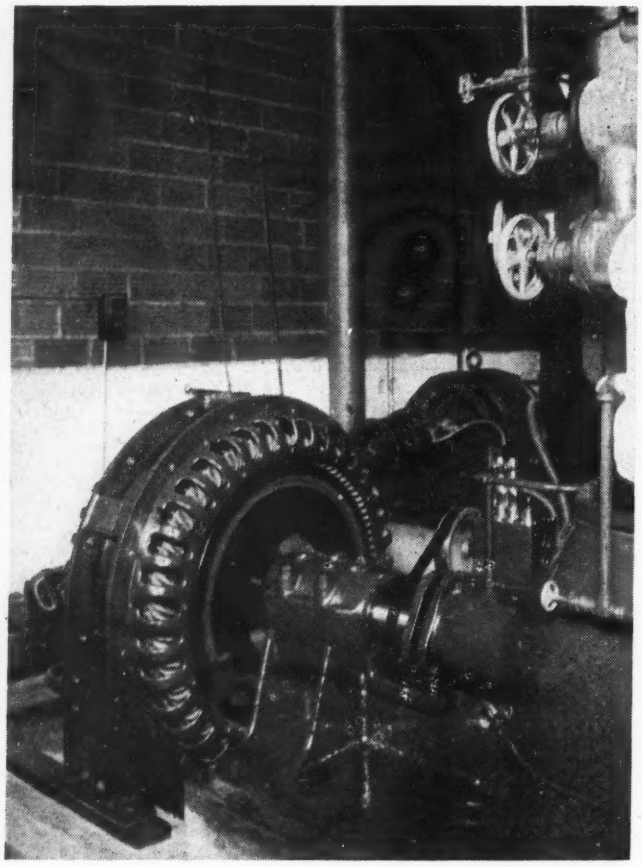
### Two Causes for Dislikes

There are two basic reasons why any person may develop a dislike for a certain food. First, it may have been that the person was required to eat it so frequently that a dislike developed. Secondly, the aversion may have started because the food was eaten under unpleasant circumstances or associated with unpleasant recollections.

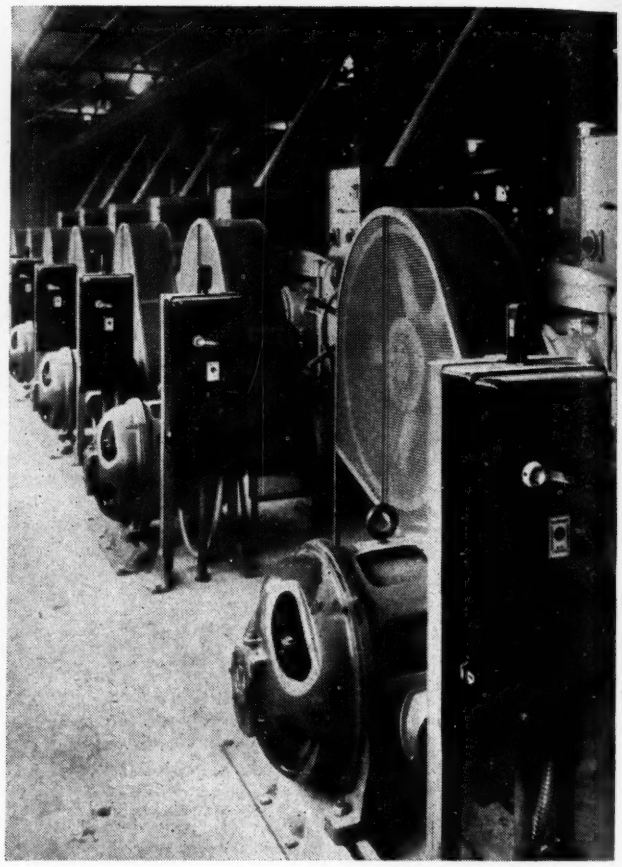
One mother of three GI's says that one of her sons will not eat potato salad because he had it nearly every Sunday evening for supper with cold cuts while in the service. That is a sample of monotony causing a dislike.

Examples of the second cause of food aversions are many. A soldier on combat duty eating cold rations,

(*Continued on page* 202)



**CLEANLINESS** is the most important factor in the successful operation of electrical equipment. Note spotless motor and machines.



**ACCESSIBILITY** of motors and control equipment makes for easier inspection and maintenance in this grain mill.

PLANT NO. _____ MACHINE NO. _____ INVENTORY NO. _____ MOTOR NO. _____

H. P. _____ MANUFACTURED BY _____

SERIES SHUNT COMPOUND SYNCHRONOUS INDUCTION

TYPE FRAME SPEED VOLTS AMPERES

PHASE CYCLES TEMP. RISE EXCITATION AMPS. ROTOR OR ARM. SER. NO.

MODEL NO. FORM NO. STYLE OR S. O. NO. SERIAL NO.

MFGRS. ORDER NO. OUR ORDER NO. DATE

CONNECTION DIAGRAM - ROTOR OR ARMATURE STATOR

| SPECIFICATION | BEARINGS | SHAFT EXTENSION | PULLEY | GEAR | V BELT DRIVE |
|---|---|---|---|---|---|
| OPEN ☐ | SLEEVE ☐ | DIA. _____ | DIA. _____ | TEETH _____ | NO. GROOVES _____ |
| EXP. PROOF ☐ | BALL ☐ | LENGTH _____ | | PITCH _____ | PITCH DIA. _____ |
| DRIP PROOF ☐ | ROLLER ☐ | KEYWAY _____ | FACE _____ | FACE _____ | BELT SECTION |
| TOTALLY ENCL. ☐ | | | | | ☐ A—1/2 X 11/32 |
| VERTICAL ☐ | | | | | ☐ B—21/32 X 7/16 |
| _____ ☐ | | | | | ☐ C—7/8 X 17/32 |
| | | | | | ☐ D—1-1/4 X 3/4 |

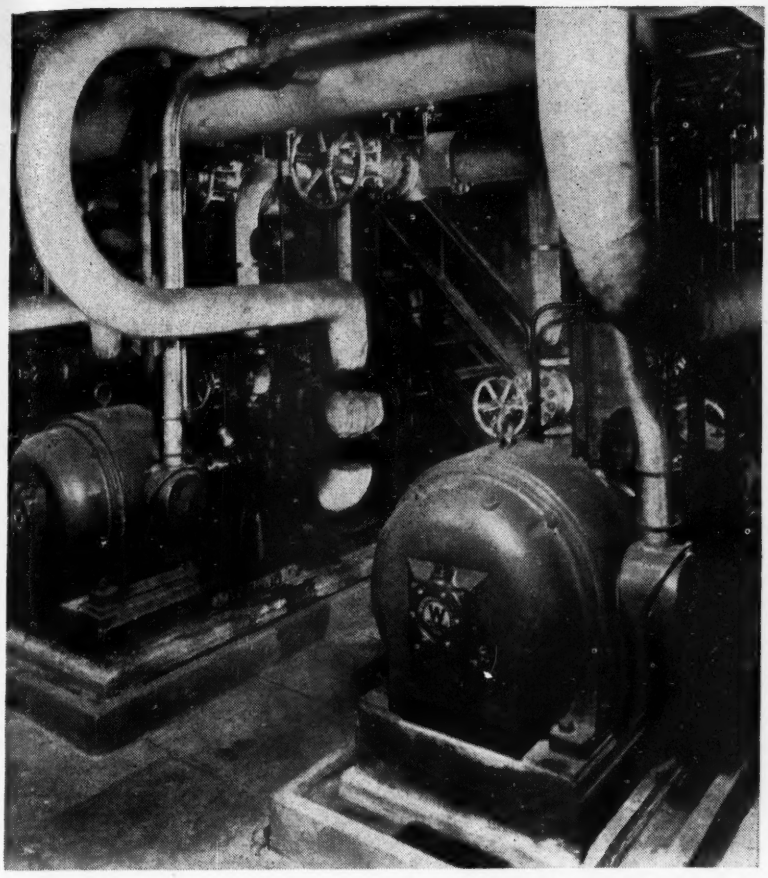
MOTOR SERVICE RECORD

| DATE INSTALLED | LOCATION | APPLICATION |
|---|---|---|
| | | |
| | | |
| | | |

| DATE REPAIRED | REPAIRS OR PARTS REPLACED | CAUSE | REPAIRED BY | TOTAL COST |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

MOTOR SERVICE RECORD FORM 18222 WESTINGHOUSE ELEC. & MFG. CO.—MAINTENANCE DEPT.

**CATALOG** all motors and controls in the plant, including spares. Such records are valuable for name-plate data reference, renewal parts ordering information and repair cost data.



SPLASH-PROOFING, and installation of these pump motors above floor level, prevent damage from water when floors of engine room are hosed.

INTERCHANGEABILITY of starters permits easy removal for inspection and maintenance.

# Electrical Maintenance Pays

**Proper maintenance of electrical equipment eliminates threatened trouble and shutdowns from wear and abuse. Reports, based on inspection at regular intervals, indicate when maintenance is needed**

By H. L. HUNTLEY, Headquarters Repair Sales Manager, Manufacturing & Repair Department, Westinghouse Electric Corporation, Pittsburgh, Pa.

PROPER maintenance of electric motors and their respective controls can be accomplished if a planned inspection system is inaugurated. Such a plan constitutes "Preventive Maintenance" and is essential to uninterrupted production in the food industry.

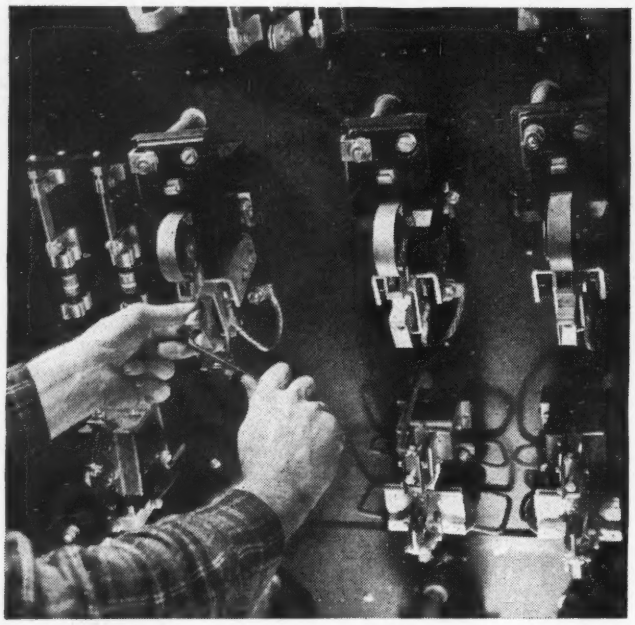
In a program of this kind the first step is to catalog all of the motors and controls in the plant, including spares. A suggested record card is illustrated. Accurate record of apparatus is desirable for reference of name-plate data and renewal part ordering information. This record would also be available to provide up-to-date information on repair costs.

Due to the many variables involved, there is no set rule or general pattern that can be applied to inspection frequency. Once the size of the plant and the number of motor applications involved are known, however, analysis of the electrical equipment can be accomplished to provide proper information for the scheduling of inspection. The two most important factors to be taken into consideration are the duty cycle and operating conditions. Inspection schedules must be flexible and adapted to the requirements of each individual plant.

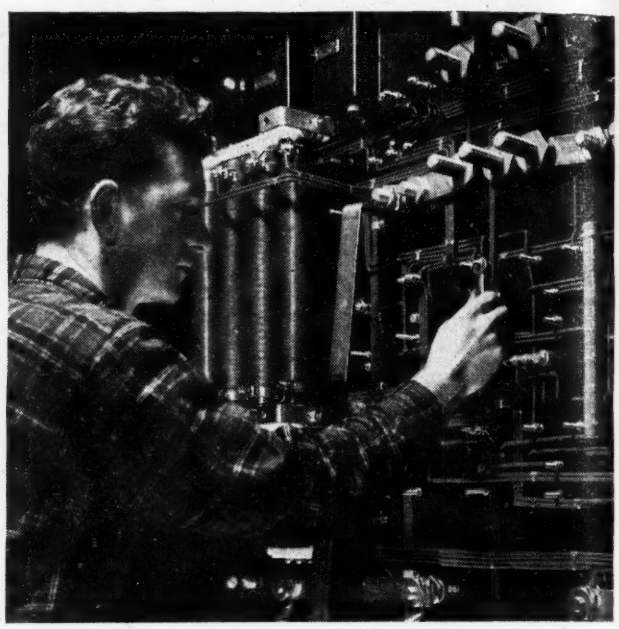
In laying out an inspection program, a simple two-way chart may be used. For example, equipment may be listed vertically on the chart and inspection dates (weekly or monthly basis) listed horizontally. This procedure provides a systematic schedule for inspections and also for the production departments in planning changes, overhaul, or repair of equipment.

Although there are many causes of motor failure, close analysis reveals that most troubles are caused by: Dirt; moisture; friction; vibration; improper voltage; improper lubrication; chemical and acid fumes; overload and, in some instances, improper application. Correct maintenance schedules should incorporate precautions to eliminate threatened trouble and

## Controls for Electrical Equipment Require Periodic Inspection and Attention



CONTACTS worn through by long use, or badly burned, must be renewed. Surfaces to which they are bolted should be cleaned.



CONNECTIONS that are loose are a frequent but very evasive source of operating troubles. They should be kept tight.

shutdown from wear, abuse and accidents from unnecessary risks. Any abnormal operating conditions should be investigated and eliminated without delay.

Good maintenance should be extended to include: Transmission and distribution of power; wiring and cables; motor and control connections; transformer banks (particularly the oil, so often neglected); proper fusing and setting of relays for lighting and power circuits and many other important items, which if neglected, can and do cause trouble, expense and loss of production.

Adequate inspection should also include the reasons for power losses. For example, an overloaded motor runs hot; this in turn deteriorates the insulation, thins the bearing lubricant and shortens bearing life. Underloaded motors run at low efficiency and power factor. Motor circuits can also be taxed far beyond the original planning; therefore, accurate voltage checks will often reveal improper voltage at the motor under load conditions.

Poor power factor is another item requiring consideration. By changing motors to fit the load, by installing synchronous equipment, or by the use of capacitors, power losses due to low power factor can be minimized.

Periodic checks of bearings of rotating equipment should include air gap measurement. Frequency of inspection including addition of lubricant or change of lubricant is only determined by analysis of operating conditions and the duty cycle. Particular care in the storage, handling, and use of bearing lubricants is extremely important.

### Cleanliness Important

Cleanliness is without a doubt the most important factor for the successful operation of electrical equipment. This applies particularly to the inside of motors and control. Many cases of motor overheating are due primarily to poor ventilation resulting from clogged air ducts in the windings. Clean motor windings can be maintained by the use of clean compressed air at regular intervals. Air suction is sometimes more desirable due to surrounding process conditions. Electrical equipment, in addition to being kept clean, must also be kept dry. Specific problems involving cleaning practices can be referred to motor manufacturers who are always ready to cooperate.

If solvents are used, special cautions as regards their selection and the ventilation where used must be exercised. For example: When motors are removed from service so the windings can be cleaned for revarnishing, the bearings and bearing housings flushed and the motor frames cleaned and repainted, proper ventilation must be provided for the workmen.

Certain materials used in a motor such as iron, steel and copper inherently have a long life. Other materials such as mica, paper, tapes and other insulation do not have these long life properties and even with the correct varnish impregnation a reasonable amount of care must be exercised to obtain the operating life expected. Just remember, good maintenance will do more than anything else to keep motors operating properly.

On the more important drives, it is advisable to make periodic insulation resistance measurements, to establish a trend of the insulation values. Any sudden drop in insulation resistance should be investigated promptly. Often, drying out the windings will restore the motor to useful and satisfactory service. Although this testing procedure necessarily involves expense, it may be the means of detecting a fault before damage or entire failure results. The question naturally arises as to what constitutes a safe operating resistance value, taking into consideration, of course, operating temperatures and atmospheric conditions. Measurements of insulation resistance are usually obtained with Megger or ohmmeter and it is generally accepted that, for safe operation, insulation resistance should be one megohm minimum when the windings are at room temperature, or about 77 deg. F. This value is being used by some of the large insurance companies that insure a.c. and d.c. rotating apparatus.

Insulation provided in most general purpose motors, unless specified to the contrary at time of pur-

## Small Parts Like Springs Should Be Carried in Stock for Replacement

**SPRINGS** on contacts should be checked with a spring balance.

WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY
MAINTENANCE DEPT.

RENEWAL PARTS PUBLICATION NO. _____

| NAME OF PART | NO. PER MOTOR | STYLE NO. | PARTS PURCHASED | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | DATE | QUAN | TOTAL COST | DATE | QUAN | TOTAL COST |
| ROTOR OR ARMATURE COILS | | | | | | | | |
| STATOR COILS | | | | | | | | |
| FIELD COILS – SHUNT | | | | | | | | |
| FIELD COILS – SERIES | | | | | | | | |
| FIELD COILS – COMMUTATING | | | | | | | | |
| ASSEMBLED SEG. OR COLL. RINGS | | | | | | | | |
| BRUSHES | | | | | | | | |
| BRUSHHOLDERS | | | | | | | | |
| BRUSHHOLDER SPRINGS | | | | | | | | |
| BRUSHHOLDER FINGERS | | | | | | | | |
| BEARING – FRONT | | | | | | | | |
| BEARING – REAR | | | | | | | | |
| OIL RING – FRONT | | | | | | | | |
| OIL RING – REAR | | | | | | | | |
| | | | | | | | | |

STARTER

| CLASS | H. P. | STYLE OR S. O. | REMARKS |
|---|---|---|---|
| | | | |
| | | | |
| | | | |

MOTOR SERVICE RECORD FORM 18222 BACK

**PARTS** replacement records indicate the activity of various items, and are useful for computing repair costs and for future ordering.

chase, is known as "Class A." This insulation comprises organic materials, such as cotton, silk and paper, varnish treated, and is suitable for all ordinary applications even where moderate amounts of moisture, oil, dust, or dilute chemical fumes are present and when the total observable temperature of the windings does not exceed 203 deg. F. Special treatments can be given to new motor windings or replacement windings of "Class A" materials for severe or extreme operating conditions of moisture, dampness, conductive dust, acid fumes or alkali dust. Motor failures should be analyzed in order to take advantage of this class of winding treatment to prolong the life of insulations.

High operating temperatures, over 203 deg. F., for long periods of time result in fast deterioration of "Class A" insulation. When higher operating temperatures prevail, then the motor replacement windings should be "Class B" materials. This insulation is inorganic and consists of mica, asbestos, or Fiberglass and is used where observable temperatures do not exceed 239 deg. F. Proper varnish treatments for operating conditions for "Class B" should be applied to obtain the highest degree of protection and long operating life. It should be remembered, however, that "Class B" windings, when used, cannot be considered as a cure all. When excessive motor operating temperatures are encountered, the operating life of the windings can also be extended considerably by the use of silicone treated windings, consisting of silicone treated wire, silicone treated rewinding materials and silicone varnish. An analysis of operating conditions and temperatures should be made to determine the economy of using this class of winding and specialists should be consulted before making the change. Manufacturers of electrical equipment have a mutual interest with the users in the successful operation of equipment and are willing at all times to extend their cooperation on operating problems.

### Controls

It is frequently assumed that both manual and automatic control for electrical equipment does not require the customary maintenance attention. In this connection it is well to remember that "control" consists of many devices, some of which require periodic attention, such as overload, overspeed and reverse current relays, bearing thermostats and circuit breaker trips. Particular attention should be given to determine proper settings of relays and, when possible, actual tests of the devices should be made to prove their protective value. Often, indicating instruments on circuits give a false picture of load conditions due to faulty calibration. It is, therefore, important that meters give a true picture of conditions for which they are intended.

Voltage should be checked to determine if proper operating voltage is available. Over-voltage shortens contactor coil life and causes excessive wear to contactors and relays. Low voltage results in slow operation with overheating and burning of contacts. In some cases actual welding of contacts can result.

Loose connections cause heat with resultant oxidation and annealing of copper contacts. Calibration of relays is also impaired with a possibility of shutdown. Making sure connections remain tight is the most important part of control maintenance. Controls must also be kept clean and dry if they are to perform satisfactorily the function for which they were designed.

The manufacturer's recommendations for care and maintenance of control should be carefully followed. Special instructions for adjustments of protective devices incorporated are usually included. If a few simple routine checks are followed on an inspection program, controls will do the job of making and breaking circuits dependably.

### Spare Parts

In order to safeguard production, it is important to review stocks of apparatus renewal parts. Worn parts, particularly contacts, should be replaced promptly when required. This means a stock of control renewal parts available at the plant stock room for immediate use. The activity of various items can be determined from stock records for

(*Continued on page* 206)

SWISS CHEESERY uses electrical water heating system to provide hot water for cheese making and apartment heating.

CHEESE MAKING EQUIPMENT, auxiliary boiler, electric and hot water control panels are on first floor of Swiss cheese factory.

# Swiss Cheese By Electricity

**Water, heated electrically to 250 deg. F. in a closed system, is used for processing cheese in Switzerland. System is economical, clean, trouble-free**

By MICHAEL MARSH, McGraw-Hill World News

ONE of the neat little cheeseries, where Switzerland produces her famed Emmenthaler, has installed a modern system of electrical heating to provide the hot water necessary for warming milk, cheese and whey. Besides adding to cleanliness, the electrical set-up is reported to involve lower operating costs than use of alternative fuels.

The cheesery, where the electric heating has been installed since 1945, is a one-tub plant, making usually only one 200-lb. cheese daily. Known as Kasereigenossenschaft Lünisberg, it is in the country near Langenthal in Bern Canton. One or two similar installations have been made in larger Swiss cheese factories during the past three years, and the system used is applicable to a plant of any size.

### Heater Operation

The system operates in principle as shown in Fig. 1. At the top of a hot-water boiler, near the exit pipe, a five-group heating unit is installed. In the same heating section two thermostats are placed. One thermostat starts a small centrifugal pump as soon as the water has reached a temperature of 244 deg. F. This pump lifts the cooler water from the bottom of the boiler up to the top near the heating unit. This reduces the temperature registered by the thermostat, shutting off the pump until the water at the top has again reached 244 deg. F.

The second thermostat shuts off the electric current as soon as the whole of the water in the boiler has reached 248 deg. F. A motor-operated graduated switch, controlled by a clock, switches the heat on during the night hours (11 p.m. to 6 a.m.) when electric current is priced more cheaply. When necessary, the current may be turned on by a hand switch. An expansion tank and safety valve are also provided.

### Patented System

The system has been patented by its Swiss inventor, Marcel Grossen, and is known in Switzerland as the "Magro" system. The equipment was built by Gebruder Ott, of Worb, and installed under the supervision of Ing. Ernest Binggelli, of Langenthal.

As installed at Lünisberg, the system consists of the parts schematically outlined in Fig. 2. Two hot-water boilers are provided instead of one, totalling 900 gallons capacity. The larger, of 580 gal., is normally sufficient, but if a second cheese is going to be made in the afternoon, the smaller, 320 gal. boiler, is also heated the night before. Both boilers are insulated with glass-wool and walled-up, the smaller one in the basement and the larger one above it.

The smaller boiler is also used in winter to heat the cheesemaker's house, and for this purpose as well as for emergencies a small furnace was built to heat the water (since electricity is in short supply during the winter).

### Cheese Making

To warm the milk and cheese and to heat the whey, the 248 deg. F. water is pumped from the top of the large boiler through the double sides of the 340 gal. cheese tub and the small 26 gal. tub, and then back into the boiler. The quantity of water can be regulated by hand valves, thus enabling the proper temperature to be attained for the different cheese-making steps.

After centrifuging, the whey is brought back to the large cheese tub, heated to about 150 deg. and then pumped into the whey-tank in front of the cheesery. After the cheese-making, the warmth left in

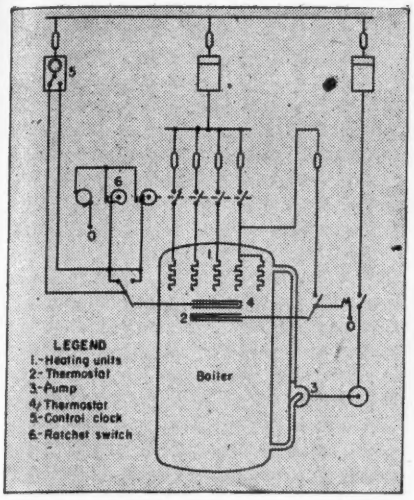



FIG. 1. Water heater with auxiliary equipment: Heating units; controls and circulating pump.

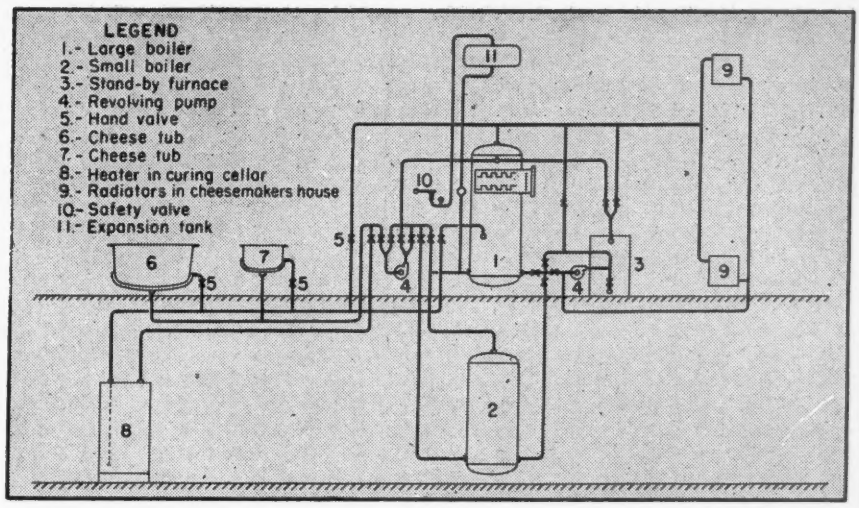



FIG. 2. Diagrammatic sketch of electric hot water system at the Lunisberg cheesery. In addition to providing hot water for cheese manufacture provision was made for heating the cheesemaker's apartment and cheese curing cellar with the same system.

the water is still sufficient to heat the curing cellar by means of an oven and fan set-up. Since the water is always in a closed system, calcification and slime formation are avoided.

A further feature of the installation is an 80-gal. hot-water boiler used for cleaning and rinsing and for domestic needs of the cheesemaker.

### Costs

Total cost of the installation amounted to about $6,000. Operating energy costs for the spring of 1946, with an electricity rate of 0.61 cents per kwh., are given in Table I.

In January, 1946, however, costs were higher because of the weather, because the cheesemaker was just getting used to the new system and because the cheesery was much less active. Only 10¼ tons of milk were processed in that month, and 2,574 kwh. were used in the heating, making the energy consumption per ton of milk 250.78 kwh. The cost of even this amount of energy was appreciably less, however, than the alternative fuel (wood) would have been, to say nothing of the increased cleanliness provided by electricity.

According to the cheesemaker, Ernest Rohrer, the electrical heating system works very well. The local utility inspects and services the equipment for him, and he has no complaints to make concerning it.

**TABLE I—Operating Costs of Magro Installation**

| | April | May | June |
|---|---|---|---|
| Milk, metric tons.... | 23.8 | 38.2 | 38.2 |
| Kwh. used ..... | 2,029 | 3,511 | 4,011 |
| Kwh. per ton..... | 85.28 | 91.88 | 105.03 |
| Energy cost, dollars.. | 12.30 | 21.40 | 24.40 |
| Energy cost per ton milk, dollars ..... | .52 | .56 | .64 |

# Fats From Coal Seen Deficient

## German scientist concludes they are pure fuel, and harmful to humans

INDICATIONS that synthetic edible fats, used to a limited extent in margarine by the Germans during the war,* were not approved by the medical profession are contained in a report recently received from Dr. F. H. Rein, of the Physiological Institute of the University, Goettingen.

### A Byproduct

According to Dr. Rein, "In the method for hydrogenation of coal according to Fischer-Tropsch for the purpose of gasoline synthesis the so-called 'paraffin-gatsch' is obtained as a by-product. It is possible to obtain fatty acids through oxidation of the paraffin contained therein. These fatty acids were esterified with glycerine and in this manner a 'fat' was produced, which during the war to a small extent was given to the German population and to the German army as an edible fat.

"Any severe sicknesses and deaths did not occur from this, but only because the amounts consumed had been too small and the period of feeding had been too short. Otherwise, this attempt to use synthetic edible fats could have done great harm.

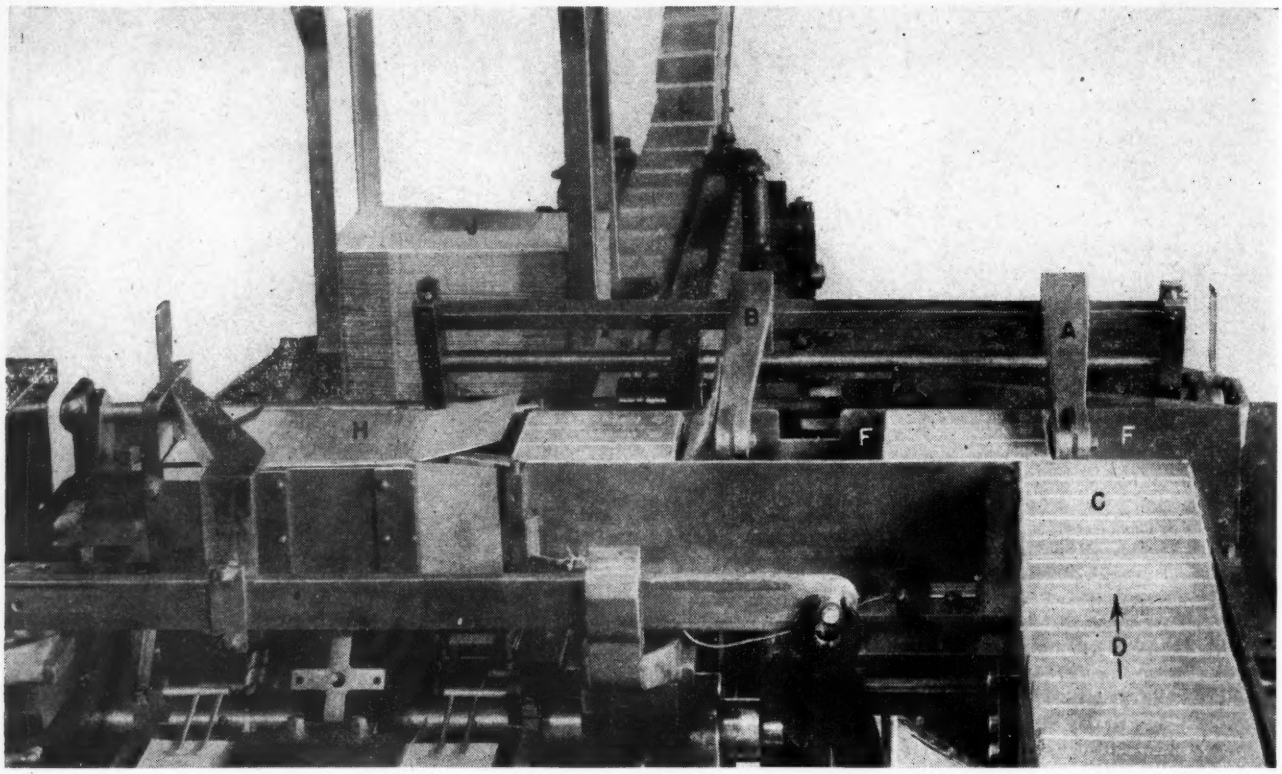
"Especially the well-known physiological chemist, Dr. Karl Thomas, has carefully tested the usability of this 'edible fat' in the animal experiment during the war. He came to the conclusion that the thus obtained fatty acids partly contain branched carbon chains, which do not exist in natural fats. These chemical groups are well absorbed from the intestine; in amounts in excess of 120 grams per day, however, diarrhea occurs in humans. Part of the absorbed fats, however, are burned incompletely in the organs. Acid metabolic products originate which are being excreted by the kidney. In the animal experiment damage to the kidneys was observed. At that time the Nazi Government forbade Dr. Karl Thomas to publish the results. But in spite of this the synthetic butter was handed out to the German population.

### Glycerine Required

"In order to make fat out of the fatty acids glycerine is needed. Synthetic glycerine leads to acute yel-

(*Continued on page* 202)

*For a discussion of the process for making these fats, and the extent of their production, the reader is referred to "Edible Oil Industry in Germany," FOOD INDUSTRIES, vol. 19, 99, March, 1947.




**CASE LOADER SETS CARTONS UP, LOADS, CLOSES, SEALS THEM**

**Fig. 1. Packages, four high on a chain conveyor, move forward until stopped by plate F. Arm A picks off 12 packages and feeds them to left one station. Meanwhile a flat carton, fed from bottom of pile J, has been opened, H. At next complete cycle arm B advances the 12 packages, feeding them into carton H. Filled carton moves downward, having its side flaps turned in at the same time. After glue is applied the outer flaps are closed, sealing the carton.**

# Improved Machines Save Labor On The Packaging Line

**Case loading and bundling machines make packaging lines in food plants more nearly automatic. Packages are continuously assembled and loaded into shipping containers, or wrapped with kraft paper to form bundles**

By FRANK H. MAYOH, Design Engineer, Pawtucket, Rhode Island

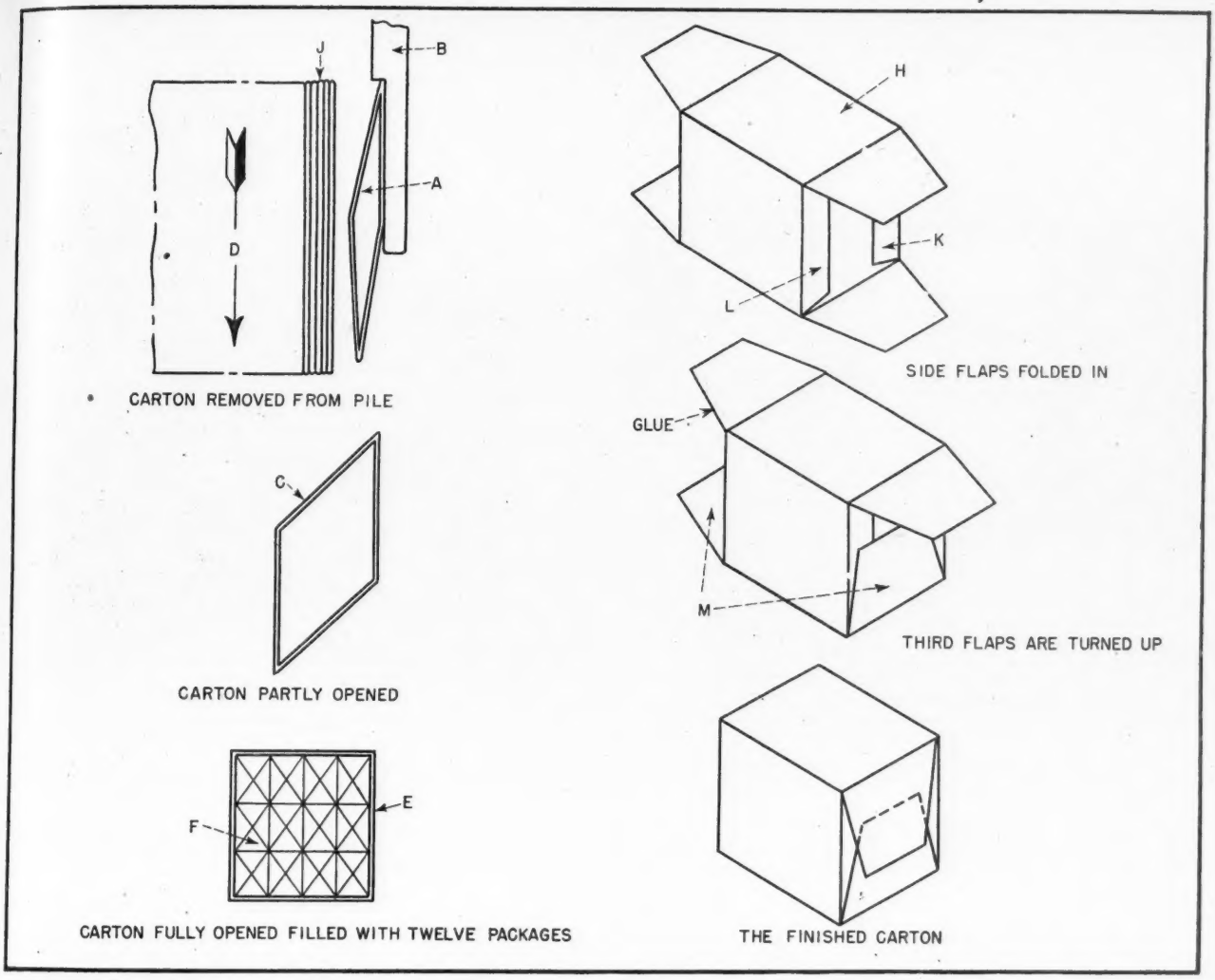
CRACKERS, gelatine desserts, prepared mixes, and other nicely packaged retail units are today coming along the production lines, where often a number of operatives are engaged in neatly stowing them away in shipping containers at the end of the discharge conveyor. Taking hold of the collapsed boxes, girls snap them open, fold carton ends and put the packages in place. Glue is applied and the final flaps are folded over.

There comes a time, however, when those of us who are package production minded look beyond all this. We see machines that assemble the desired number of packages, bundle them in kraft paper, or insert them into opened cartons, which are automatically closed, sealed and placed on a discharge conveyor.

Illustrated above is such a carton bundling machine. With this unit, twelve packages are inserted automatically into an opened carton, which is then closed and sealed. Fig. 2 gives the sequence of machine operations performed.

The line of packages, *C*, Fig. 1, is fed along on the conveyor chain in the direction *D* until the end packages are against plate *F*. The slide that carries the two arms *A* and *B* moves to the extreme right, where arm *A* is clear of the oncoming packages. In this position arm *A* picks twelve packages off the conveyor chain and feeds them one station to the left.

At the next complete cycle in the machine operation, arm *B* advances these same 12 packages and feeds them into the paperboard carton *H*,




## SEQUENCE DRAWING SHOWS OPERATIONS ON SHIPPING CASE

**Fig. 2. Carton A is removed from bottom of pile J by pusher slide B. As it moves in direction of arrow D, carton is partly opened, C, then fully opened and filled with 12 packages, F. As it is lowered from filling station, side flaps K and L on both ends are folded in. In subsequent operations, bottom flaps M are folded up, glue is applied to underside of top flaps, which are then folded down forming the sealed carton that is discharged from rear of machine.**

while arm *A*, of course, advances twelve more cartons to the filling station.

A flat carton has been fed from under the pile of cartons *J* at the rear of the machine. It has been opened up and placed in position ready to receive the twelve packages prior to the package feed taking place. The method of doing this is shown by the views at the left in Fig. 2.

The carton *H* with packages in it is then carried to a lower level, having its inner flaps turned over. After glue is applied the outer flaps are turned up. A line of discharged cartons is shown coming out of the machine at *L*.

### Carton Forming

Taking one carton *A* from the bottom of the stack *J* (Fig. 2), a pusher slide *B* carries it in the direction of arrow *D*. As it moves along it gradually assumes the appearance *C* until it is further opened up into the fully squared position shown at *E*, where twelve packages *F* have been put in place, three wide and four high.

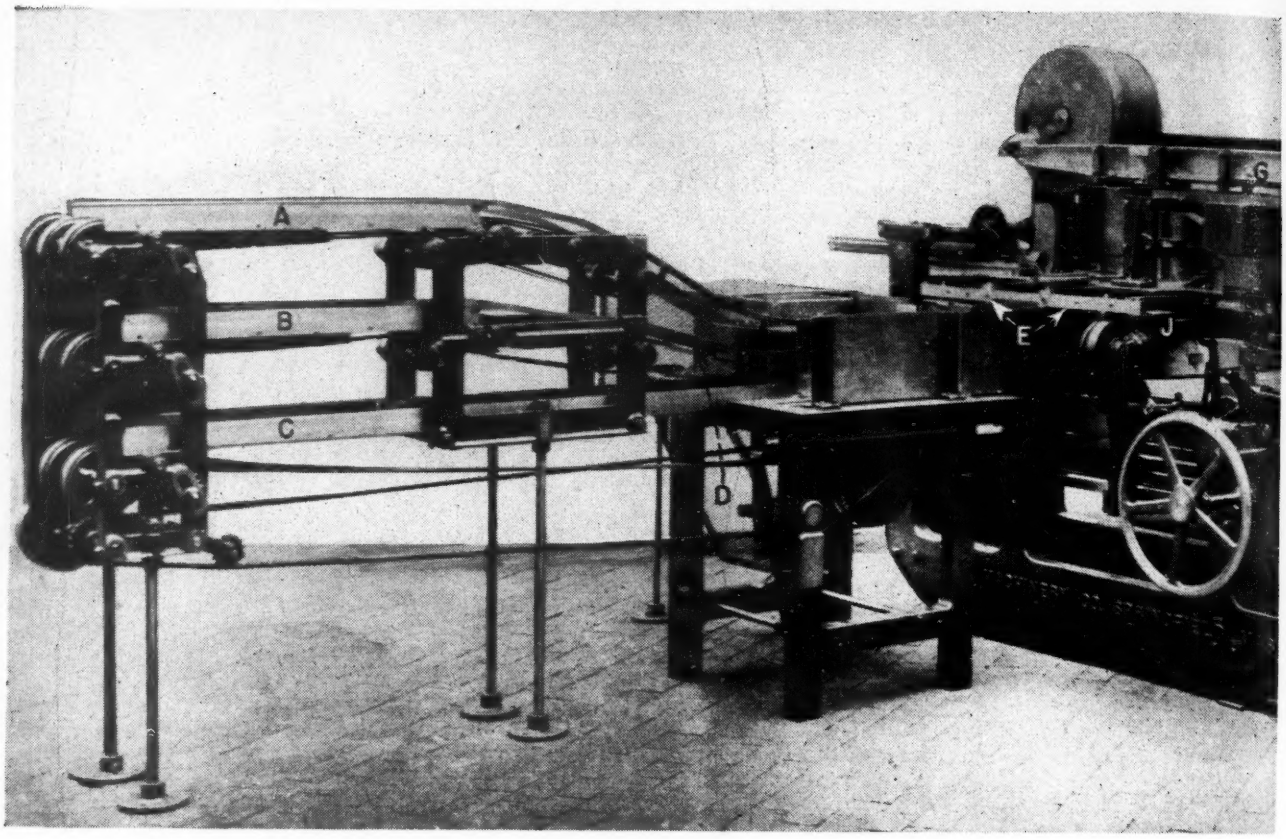
These three views are drawn from the end of the machine, Fig. 1. They are intended to be merely illustrative of the function performed. Actually, it is sometimes necessary to incorporate in the machine considerable mechanism to open cartons, such as suction devices, side opening blades and carton stack lifting devices, in addition to cross folding slides.

Referring to the perspective views of the carton shown at the right of Fig. 2, the upper view shows how the carton would appear after the two inner flaps *K* and *L* have been turned in at both ends. The center view shows the carton after the third flap has been turned up, while the lower view shows the finished carton with flap *N* turned down. All the folds are made by suitable rotating arms or fold turnover plow cams as the package is carried along. Glue is applied to the flaps by rolls that control the placing of same and amount used.

### Package Wrapping

Bundle assembly and wrapping are performed by the machines in Fig. 3, which shows how three lines of packages are conveyed from the left side of a bundling machine into a central position so that, as they enter the machine, they are ready to be wrapped into a bundle with heavy kraft paper. Fig. 4 illustrates in detail the sequence of operations performed while doing this, end seals often being placed on the packages as indicated.

Assume that small cartons or wrapped packages are coming along three separate conveying lines in a bakery so that one line enters at each of the three levels, *A*, *B* and *C*, Fig. 3. Going down the incline at *D*, the packages are stacked three rows high as shown at *A* in Fig. 4, where packages are four wide to the row and three rows high. They are then picked off the line by the




## BUNDLING MACHINE ASSEMBLES AND WRAPS PACKAGES

**Fig. 3. Packages, entering on three conveyor lines A, B and C, are stacked three rows high at D. They are picked off the line at E, carried to right into body of machine and completely wrapped in kraft paper, then discharged.**

plunger *B* shown below them, located in the machine, Fig. 3, at about the position indicated as *E*. The packages are then carried to the right in Fig. 3, into the body of the bundle wrapping machine, where they are transported from station to station by carrying fingers on the arm *G*.

As the bundle is carried along by a sliding action it is completely wrapped in a manner that will best be understood by referring to Fig. 5. Again referring to Fig. 3, part of the end folding mechanism is shown at *H*, while at *J* on the same illustration, the front of the sheet carrying mechanism is shown.

This is used to bring the cut-off sheet of wrapping paper forward into the first wrapping station of the machine from the roll feed mechanism (not shown), this being at the rear.

### Wrapping Operations

Figs. 4 and 5 show the sequence of operations performed in wrapping the bundle. Fig. 4 is a plan and end view of the package and wrapper assembly at about the position *E* in the machine, Fig. 3. It shows how the sheet is brought into position above the bundle.

Referring to the upper right view, which is looking from the right end of the machine, the paper *X* is fed from a roll *Z*, being pulled along by feed rolls *C*. The cut-off knife, diagrammatically indicated at *D*, severs the sheet, which is left supported in guides at *E*. This sheet is next taken by a pair of gripper fingers *F* and is pulled into the position *G*, where it is directly over the group of 12 packages *A* which are to be lifted up by plunger *B* while the bundle wrapping operations are performed.

Assembly of the packages below the sheet of paper is shown by the view at the right, where the packages coming along the conveyor lines *K* are delivered on the elevator plate *B*, being held against the back plate *H* by the oncoming packages. Elevator plate *B* moves in the direction of arrow *J* and picks twelve packages off the line, lifting them up to the position *L* along with the sheet of paper *G*.

Referring to Fig. 5, *A* and *G* are the packages and sheet of paper respectively, in the same position as in Fig. 4. From the lower level *A* the packages are lifted with the sheet *G* to the upper level *L*, the sheet folding until it assumes the "around the bundle" shape shown at *M*. There is a slide at *N* that feeds under the bundle, making the first long fold *P* and closing gap through which packages were lifted.

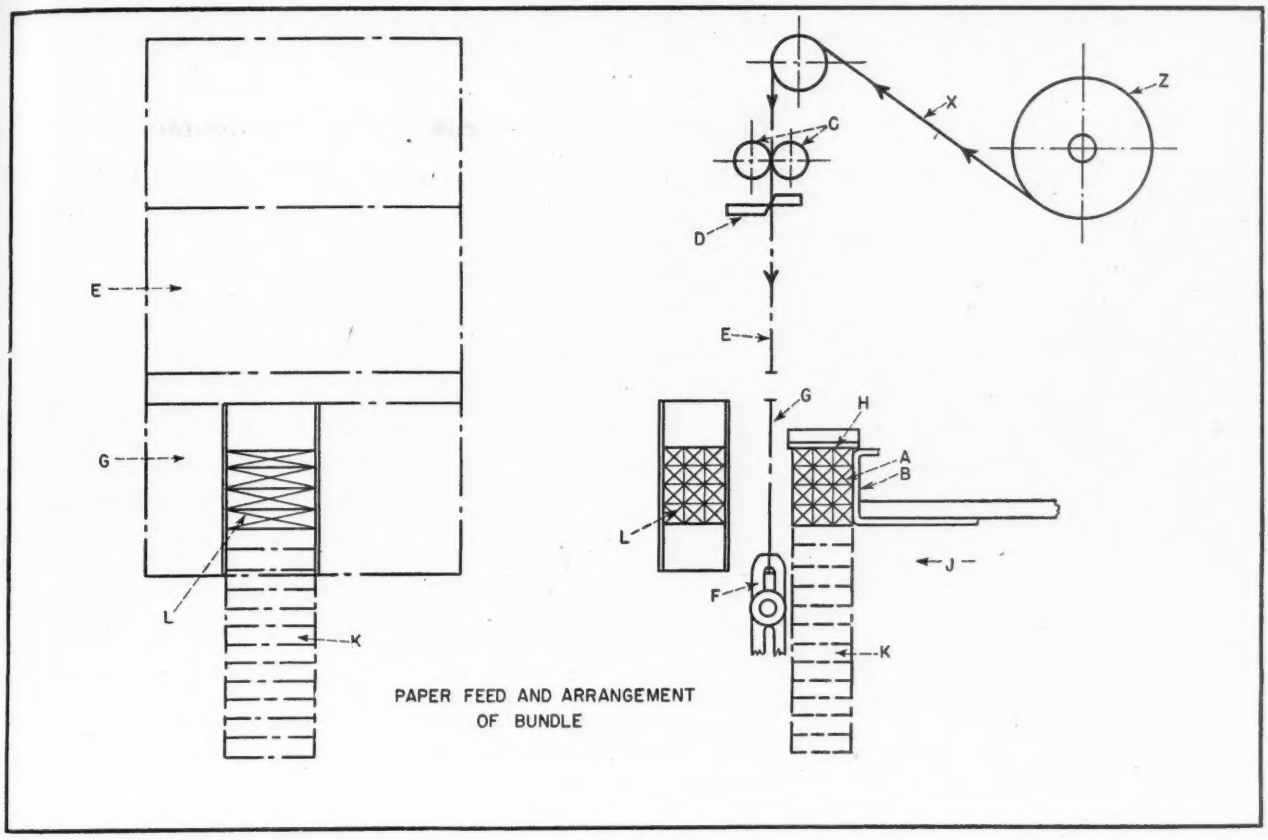
Slide *Q*, traveling in the direction of arrow *W*, now pushes the partly wrapped bundle lengthways until it reaches the position *R*. During this operation the second longitudinal fold at *S* is made, together with the first end tuck at *T*, by tucking finger *V* carried forward by the slide *Q*.

As the bundle is transported from position *R* to *A-1* the second end tuck *B-1* is made by folding plate *C-1*. The third fold *D-1* is also made by plow folder *E-1* as the bundle is transported to position *A-1*. The fourth and final fold *F-1* is made by the upper plow *G-1* as the bundle is transported to *H-1*.

The bundle of twelve packages is now completely wrapped, it of course being understood that glue has been applied to secure the folds as the wrapping operation progressed.

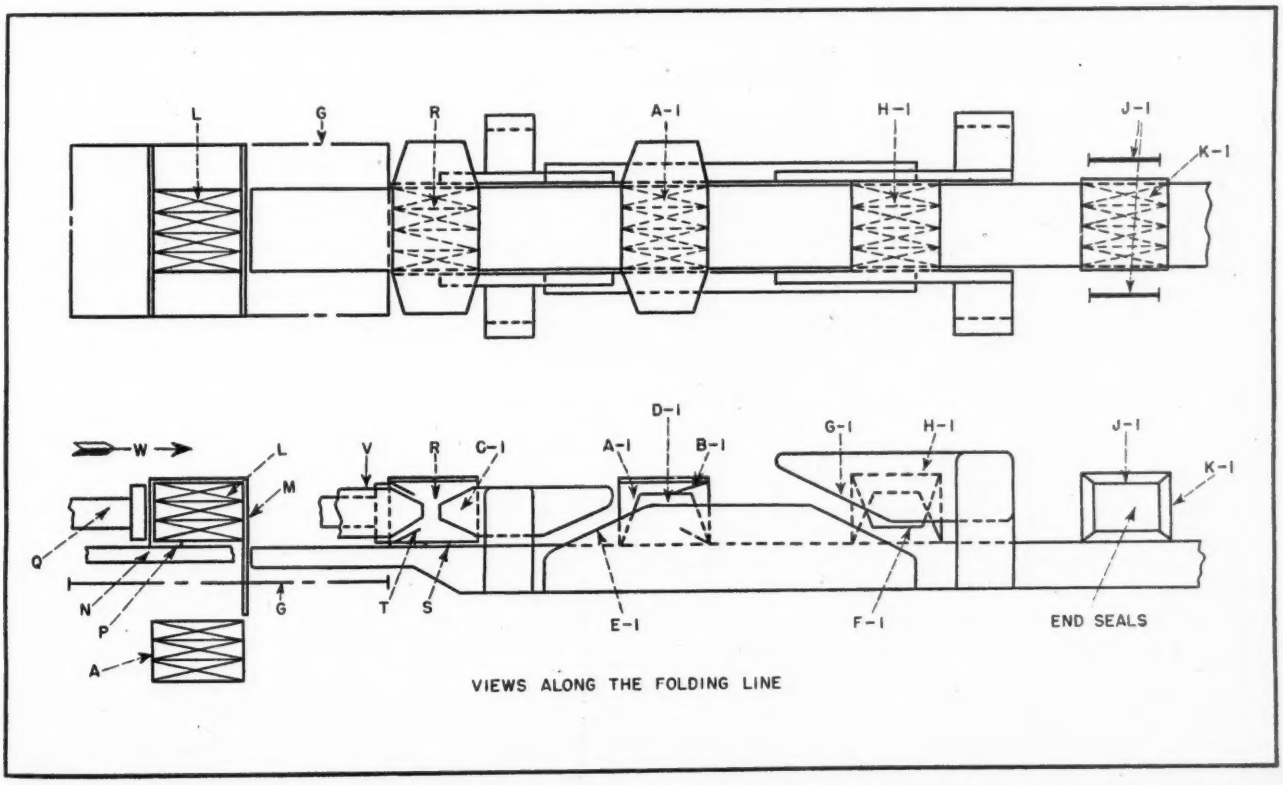
Before the bundle leaves the machines there is one other operation to be performed. This consists of applying end seals *J-1* to the bundle at *K-1*.

Folding operations at the two ends of the bundle progress along simultaneously, the two lower views in Fig. 5 being a front and plan view respectively along the bundle folding line.




## SHEETS OF KRAFT ARE CUT AS BUNDLES MOVE UPWARD

**Fig. 4. Kraft paper from roll Z, pulled along by feed rolls C, is cut to desired size by knife D. A sheet is moved to position G, above assembled packages A, by gripper fingers F. Plunger B lifts assembled packages and paper into position.**




## SEQUENCE DRAWINGS SHOW FOLDING AND TUCKING OF WRAPPING PAPER

**Fig. 5. As packages and wrapping paper are lifted from A to L, the sheet is folded around three sides of the bundle, shown at M. Plate N feeds under bundle, making fold P. As plunger Q pushes partly wrapped bundle to position R fold S is made. End tuck T is made at the same time by tucking finger V. The second end tuck, B-1, is made by plate C-1, and third fold, D-1, by plow folder E-1, as bundle is moved to A-1. Final fold, F-1, is made by plow G-1 as the bundle moves to H-1. Final operation is application of end seals.**

# Citrus At New Crossroads

**Ever-increasing output of citrus has created new marketing problems. More processing of fruit, improved quality of products, may prove the solution**

By SANFORD PARKER
McGraw-Hill Department of Economics

IN the 1946-1947 season now drawing to a close, the whole citrus industry has weathered some turbulent postwar readjustments fairly successfully. As a result it is facing the new year that is soon to open with a considerable revival of confidence.

Some worrisome questions, however, are inevitably hanging over from the up-and-down experience of recent months. And there is always the longer-range problem to face of a continually expanding output weighing on the market.

Over-all analysis of output, prices, and expenditures on citrus fruits, both fresh and canned, suggests that the industry is, indeed, approaching a new crossroads.

### Output Increase to Continue

Long-term growth in production still stands out as the primary fact about citrus markets. Even if there should be no new plantings of citrus trees, output of citrus fruit can be expected to increase steadily for many years to come. For citrus trees are exceptionally long-lived. With the application of latest discoveries in fertilizers, the citrus groves continue thrifty, and, unlike apple trees, seemingly never die of old age. Moreover, new plantings have not stopped; in some sections they were speeded during the war.

The resulting implications become clearer in light of the long-term record of U. S. citrus fruit production (in billions of pounds, fresh fruit weight):

| Year | Output | Gain | Percent Gain |
|---|---|---|---|
| 1919..... | 2.5 | | |
| 1929..... | 5.7 | 3.2 | 128 |
| 1939..... | 10.6 | 4.9 | 86 |
| 1947..... | 16.1 | 5.5 | 52 |

Percentagewise, increases in citrus output are slowing down over the years. That's only natural. But in point of actual poundage, the industry is growing more rapidly than ever. The 1939-1947 rise far exceeds that of two previous decades. That's the more important fact. And output will continue to rise in years to come.

Even before the war, marketing this output was becoming an ever more trying problem. But the war staved off the need to meet it. For in those years, most of the steady increase in production was absorbed by military, lend-lease, or export uses. Domestic civilian supplies went from just under 10,000,000,000 lb. to just over 11,000,000,000 between 1939 and 1945. But they jumped to over 13,000,000,000 lb. in 1946, with a reduction in war use. And prospects for 15,000,000,000 lb. for civilians in 1947 came into view at the end of last year as output continued to advance.

No wonder, then, that sinking spells seized the business last year. Prices just cracked wide open in the face of such large and successive increases in supplies.

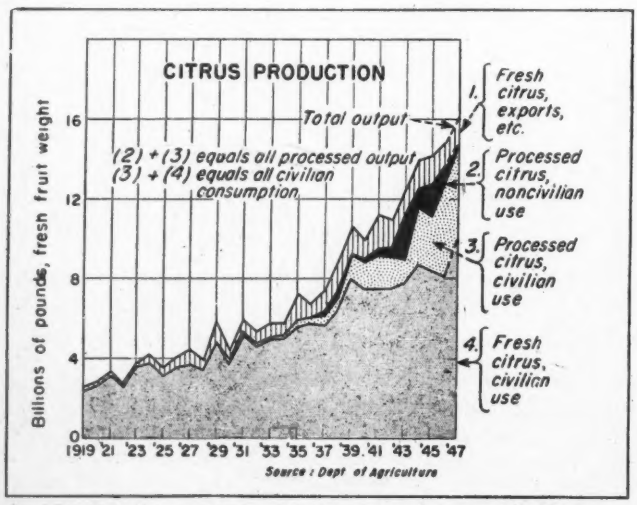
### Canned Juice New Feature

However, citrus' war record—and postwar performance—has boasted another and fundamentally new feature. That is the enormous growth in canned juice production, from 1,200,000,000 lb. to 5,500,000,000 lb. (fresh fruit weight) between 1939 and 1946. It's this that has made the major contribution over recent years towards easing citrus marketing. For that rise in canned output took up all the increase in total fresh citrus production over those years, and in 1946 exceeded one-third of total citrus tonnage. Volume of fresh fruit supplies held pretty stable.

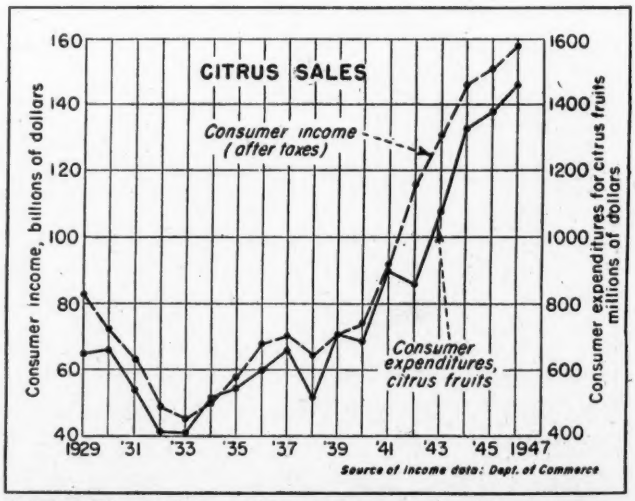
Savings in production and distribution costs, brought about by canning, helped considerably to widen over-all markets. Processing serves to move a given volume of fruit at lower prices, especially in off-seasons.

As a result, consumer expenditures for citrus have kept in line with buying power. Quite naturally, over prewar years, total spending on citrus fruits, fresh or proc-

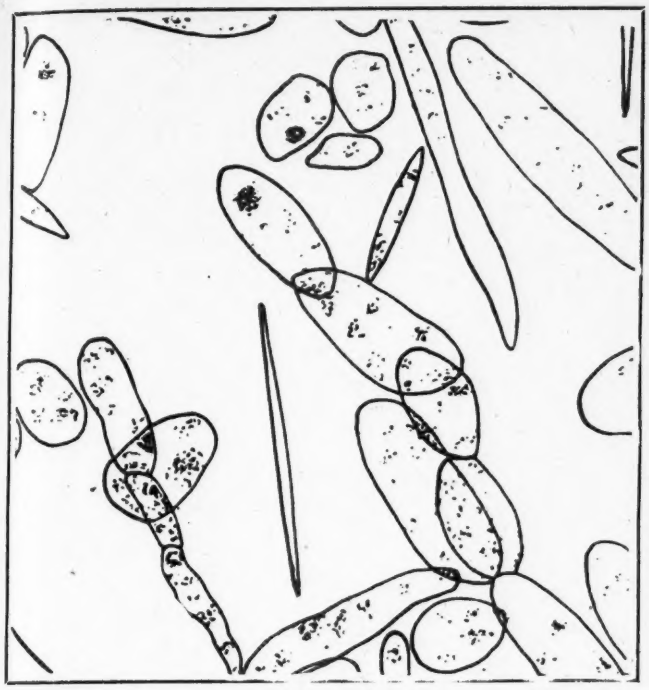
(*Continued on page* 204)


CITRUS PRODUCTION
Billions of pounds, fresh fruit weight
Total output
(2) + (3) equals all processed output
(3) + (4) equals all civilian consumption
1. Fresh citrus, exports, etc.
2. Processed citrus, noncivilian use
3. Processed citrus, civilian use
4. Fresh citrus, civilian use
1919 '21 '23 '25 '27 '29 '31 '33 '35 '37 '39 '41 '43 '45 '47
Source: Dept. of Agriculture

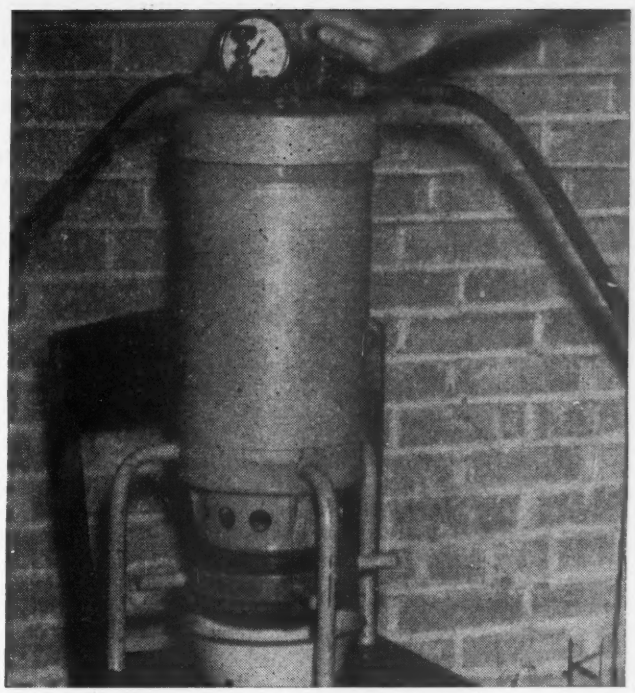
**PRODUCTION** data show rapid increase of processed citrus.


CITRUS SALES
Consumer income, billions of dollars
Consumer expenditures for citrus fruits, millions of dollars
Consumer income (after taxes)
Consumer expenditures, citrus fruits
1929 '31 '33 '35 '37 '39 '41 '43 '45 1947
Source of income data: Dept. of Commerce

**CONSUMER** spending on citrus kept pace with rising incomes.



CELLULAR structure of peaches accounts for difficulties in recovering juice. Cells are encased in pectinous skins.



PILOT extractor at Georgia Tech experiment station is used to work out trial hydraulic press cycles for treatment of pulp.

# Special Filtration Yields More Peach Juice

**Improved methods of preparing peach juice have been eagerly sought by wine makers owing to difficulties with peach puree in fermenter tanks. Special filter press may aid commercial production of juice**

By D. S. BENTLEY, Vice-President
Monarch Wine Company of Georgia, Atlanta, Georgia

IN this day of juice-consciousness it may seem a bit incongruous that any considerable difficulty should be encountered in squeezing the juice from a peach. It is nevertheless true that this seemingly elementary operation poses an engineering problem of considerable proportions, the solution of which is not yet satisfactorily completed.

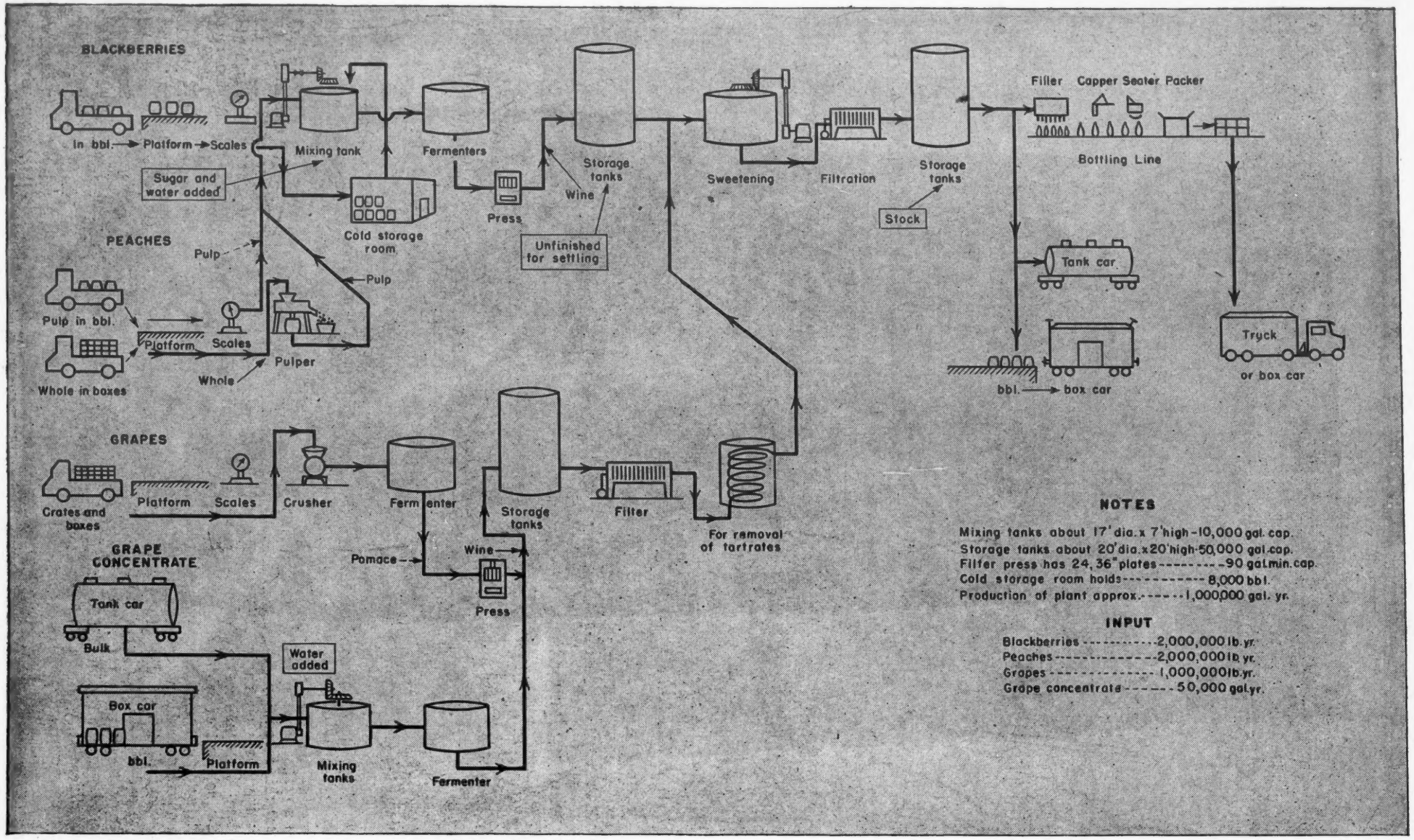
The attack on this problem by our company was indirect. It did not result from a desire to obtain peach juice per se, because our interest in peaches lay in the production of peach wine. It was the almost desperate hope of overcoming the mechanical difficulties presented by peaches in wine manufacture that led to the search for a process of obtaining peach juice.

### Peach Puree

In the usual process of manufacture, peaches enter the winery in the form of pulp produced by any one of several types of machines. The most common employs revolving blades inside a conical screen which removes the pits and reduces the body of the peach to a puree.

To this pulp are added sugar and water in the ratio of from 100 to 500 gallons of sugar solution per 1,000 gallons of juice calculated to be contained in the pulp. In some instances dry sugar is added. The allowable ratio of amelioration is established by Federal law and is determined by the total acidity of the peach material and the quantity of additional sugar required to yield 13 percent of alcohol by volume during fermentation. At this stage of the process the peach pulp can be pumped without too much difficulty.

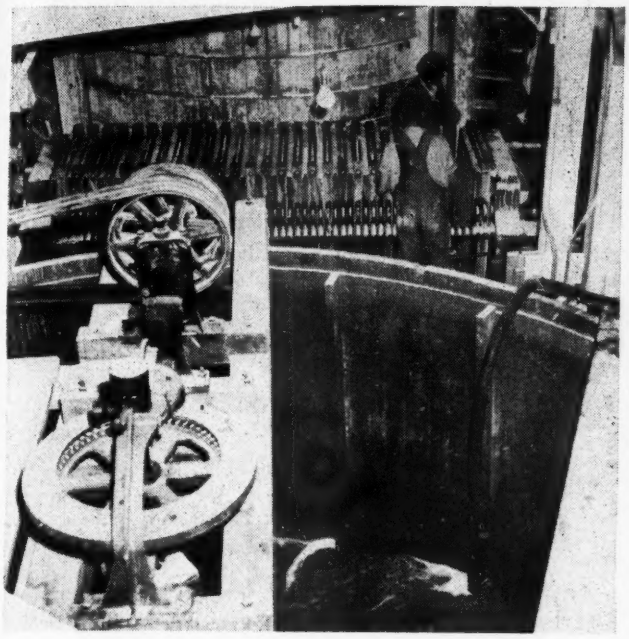
The evolution of carbon dioxide during fermentation keeps the material in a homogeneous state, but after completion of fermentation peach pulp begins to display its perverse and unpredictable nature. Usually a break occurs, and the semi-solid mass begins to separate from the relatively clear wine. The specific gravity differential, how-



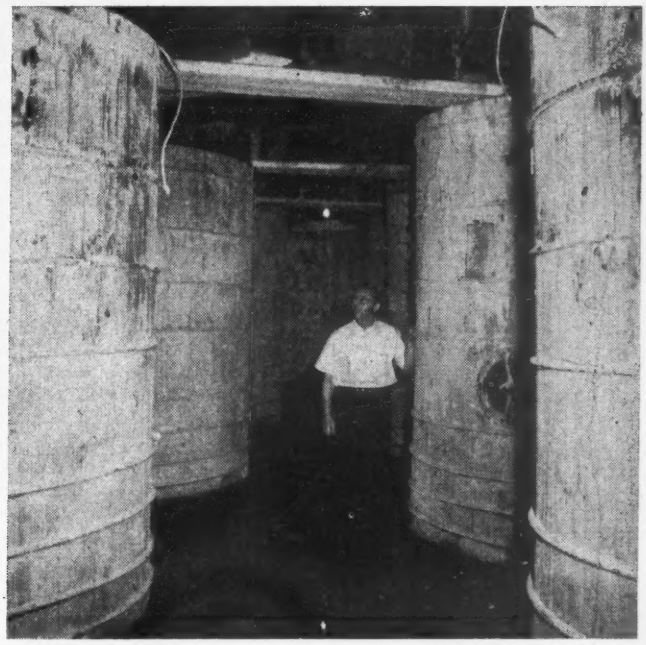

## Peach Line Is One of Four Streams At Monarch Wine Plant in Atlanta

**FLOW SHEET of wine making operations at the plant of Monarch Wine Company of Georgia shows how the manufacture of peach wine fits into the production streams of a winery using a number of different fruits. Because of mechanical difficulties encountered in the separation of pulp from peach wine several methods are still being tried in an effort to obtain a clear juice.**

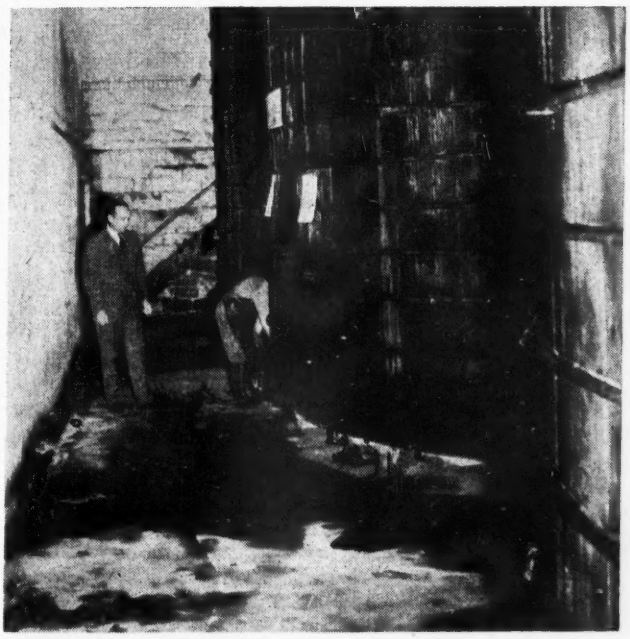
## Perversities of Peach Pulp Show Up at Fermentation Stage



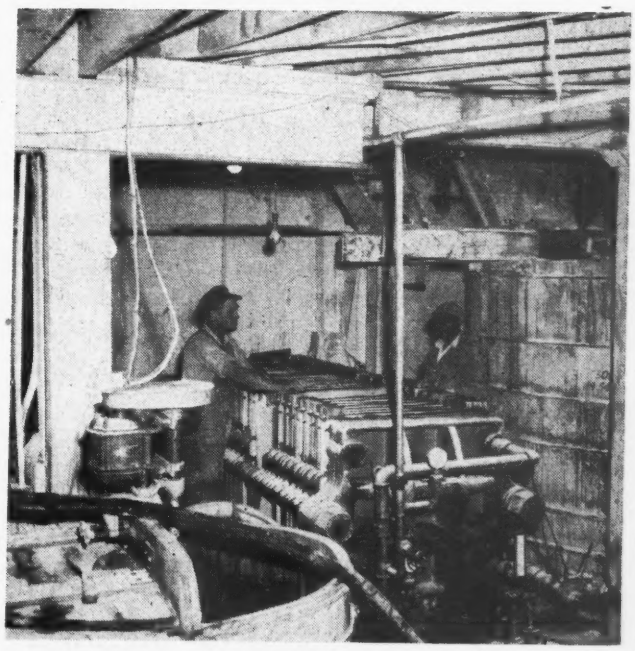
1. MIXING peach pulp with sugar sirup for 13 percent alcohol production. Puree resembles beaten apple sauce.



2. FERMENTING in open tanks. After fermentation, pulp may rise, sink or stratify, creating a separation problem.



3. STORING the fermented peach wine in 50,000 gal. tanks to precipitate suspended solids not removed by wine press.



4. FILTERING in filter press, after storage and amelioration, produces clear, sparkling wine ready for bottling.

ever, is not sufficient to effect a complete or dependable separation. Normally the solid material settles to the bottom of the tank, but sometimes it goes to the top and sometimes there is no separation, or, at most, only alternating strata of liquid and thick pulpy material. Under optimum conditions, not more than 50 percent of the contents of a tank can be withdrawn in a reasonably clear state.

The gravitational separation increases with time, when the tank is left completely undisturbed, but such procedure is not consistent with maximum plant efficiency or maximum quality in the finished product. The thick portion that does separate can only be handled with the greatest difficulty. It is too heavy and slimy for satisfactory filtration and too thin for pressing. When separation of the material by settling was found to be unsuccessful, attempt was made to maintain its homogeneous condition and filter it in that state. While considerable advance was made with improved filtration methods and procedures, the problem was not entirely solved.

Of course, the material could be distilled into peach brandy, but that was not the solution we hoped to achieve. An effort was made to fit to our purpose all manner of machinery designs, such as different types of filters, presses, centrifuges and vibrating screens, which had proved successful with other fruit and vegetable pulps, but to no avail with peaches.

Turning our attention to the physical nature of the peach, the

reason for the mechanical difficulty in handling it became apparent. Examination of peaches under the microscope reveals a structure not unlike the grapefruit but, of course, on a much smaller scale. That is, the juice is encased in tiny segments, prolately spheroidal in shape, with a skin of pectinous material.

The particles in most fruits are such that they can be easily strained or filtered out, but those in the peach are round and gelatinous, forming a pectinous mass over a filter or strainer that soon becomes impenetrable. Filter aids and inert precipitants are of little use in coagulating and settling this suspended material.

In the manufacture of wine from grapes and most other fruits, fermentation is usually conducted in the presence of the fruit pomace, in order to extract color, tannin and other constituents necessary or desirable in the finished product. This procedure is not necessary, however, in the manufacture of peach wine. Since the problem arose from the presence of material not essential to a satisfactory product, it became apparent that the logical approach lay in attempting to extract the juice, which comprises from 85 to 88 percent of the peach by weight, and in starting the wine making process with the juice rather than the unmanageable pulp.

### Research Instituted

This conclusion, and the impetus presented by the hitherto unavoidable destruction of thousands of gallons of material containing from 35 to 65 percent of marketable wine, resulted in a decision early in 1946 to enlist the services of the Research Institute at the Georgia School of Technology in Atlanta.

After discussing the matter with Dr. Frederick Bellinger of the staff at the Institute, arrangements were made for my company to sponsor a project which had for its goal the rather elementary sounding "Extraction of Pulp Free Juice from Peaches."

Preliminary search of the literature revealed little else than that, insofar as published data were concerned, a virgin field lay ahead. The survey did suggest, however, that enzymatic clarification, slow freezing and/or centrifugation might assist in satisfactory extraction. The objective was then resolved into the following approaches:

1—High pressure extraction.
In the conference preceding the initiation of the project, it was assumed that experience with conventional machinery precluded the hope of extraction of juice from a mass of pulp at pressures normally used for such operations. No data were available with respect to very high pressures.

2—Determination of the effects of "filter aids" on the filtration characteristics.
This study was indicated by the fact that beneficial effects had been noted by using diatomaceous silica in pressing other fruits, particularly grapes.

3—A systematic study of the effect of (a) slow freezing (b) "fast" freezing and (c) "anti-pectins."
These studies were aimed at the pectinous bodies present, because from available data it was obvious that the pectin present in the pulped peaches would prevent satisfactory filtration by customary means.

4—Determination of the characteristics revealed by centrifugation.

### Initial Findings

Without attempting to outline in chronological order the experiments made, and the studies pursued by the Research Institute, or to set forth in detail all the negative data that resulted in elimination of various technics and procedures that originally were considered feasible, the primary experimentation may be summarized as follows:

Centrifugal separation was found to be impracticable, apparently because of the previously mentioned small specific gravity differential between the juice and the suspended matter. This procedure was also tried after treatment of the pulp with Pectinol for varying periods of time. With a centrifugal force of 1,590 times the force of gravity a yield of only about 50 percent by volume was obtained.

Enzymatic decomposition of the pectin was discarded because the fermentation which developed during the time interval necessary for the "anti-pectin" action could not be tolerated. Neither were hopeful results obtained from the preliminary trial of freezing technics designed to rupture the pectinous cells.

There followed a series of high-pressure filtration tests in plate and frame presses, from which it could be concluded that a relatively clear juice to the extent of approximately 30 percent of the pulp volume is easily obtained, but higher ratios did not result from increased pressures. It was apparent that increasing the pressure alone served only to close the filtration channels in the compressible pulp mass. In fact, it was found that there is a critical pressure beyond which it is not practicable to go.

### Filter Aid Helpful

Through the cooperation of the Dicalite Company, further filtration studies were made with the use of diatomaceous silica filter aids, on the theory that a porous filter cake could thus be maintained. In the course of this study it was found that, by using from one to two percent Dicalite filter aid, yields of juice as high as 87 percent by weight were obtained.

One of the progress reports at this stage of the project described the results as follows: "The filtrate from this pressing contains small amounts of fibrous material which, if desirable, can be removed without difficulty by ordinary filtration. The residue from the pressing step resembles an orange peel in texture and is easily removed from the filter cloth, leaving the cloth free for continued use.

"Ordinary filtration methods, with or without filter aids, and with or without pretreatment with Pectinol, are impracticable if they are applied to the pulp prior to the press operation."

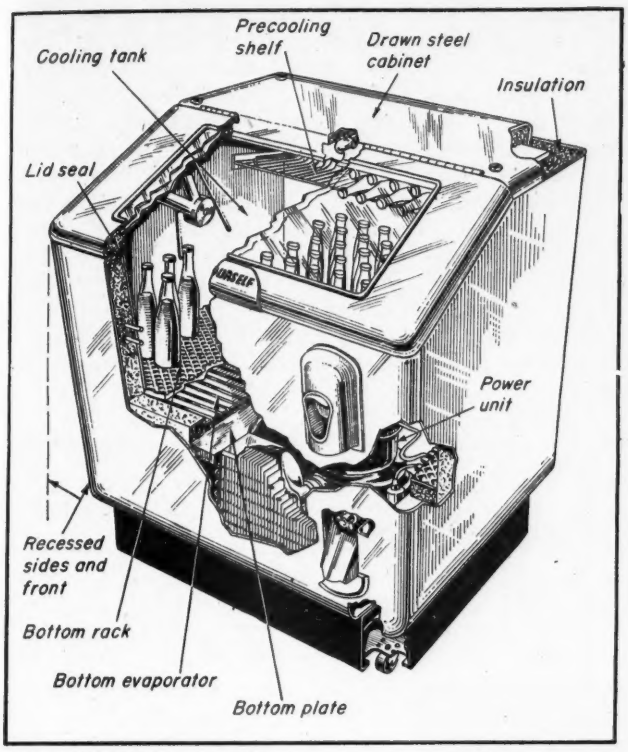
Since this yield of 87 percent approached the total moisture content of the average peach, the results were considered almost phenomenal. Accordingly, other, more involved avenues of approach to the problem were abandoned in favor of a carefully planned series of test runs to obtain pressure-time-yield data in relation to pressure chamber design.

### Batch Process Abandoned

These tests revealed a highly successful method of juice extraction on a batch basis. My company felt, however, that to be assured of a feasible commercial production, a continuous method of operation must be developed. Such a method would tend to eliminate the ever-present hazards of fermentation and enzymatic oxidation that make the time element so important in the handling of peaches.

It was necessary, therefore, to re-study the experimental data, with particular emphasis on the time of application of pressure, the thickness of cake produced, and the volume of filtrate collected. This study established the high probability of obtaining over 80 percent yield of juice from peach pulp by means of such a pressing operation. Peculiarly enough, however, when

(*Continued on page* 206)




**NEW BEVERAGE COOLER** has several outstanding features. It is easy to convert it quickly from a wet to a dry-type unit.

**FINNED RACK** chills bottles quickly in a dry electric cooler. Rack is not used when cooler is converted to a wet-type unit.

# Wet-Dry Cooler for Beverages

## Conversion of dual cooler is easy. Cooling time is reduced with finned rack and stamped, seam-welded steel sheets that simulate tubular coils

A RADICALLY new method of beverage cooler refrigeration, developed by Canada Dry and introduced this summer in this country and abroad, makes it possible to easily and quickly convert their wet-type electric cooler to an efficient dry-type electric unit.

### Method Used

This conversion is accomplished by: (1) Draining the water, (2) removing the rack in the bottom of the cooling tank and replacing it with cast aluminum finned racks, (3) making a minor service adjustment on the thermostat, and (4) loading the finned racks with bottled beverages.

The finned racks, refrigerated by contact with bottom and side coils, cradle each bottle and achieve rapid chilling by conduction, instead of by the slow air cooling of most dry-type beverage coolers.

Bottom coils are unlike the coils of other dry coolers, which are clipped or soldered below a steel sheet on the bottom of the tank. Instead, more efficient cooling is obtained with two stainless steel sheets which are stamped and seam-welded to simulate tubular coils.

The new self-service cooler, when used as a "dry" unit with finned racks, holds 53 7-oz. size bottles and 29 12-oz. size bottles, for a total of 82. A precooling shelf holds an additional 22 7-oz. size bottles. The front portion of the finned rack is designed for the smaller bottles and the back portion for the larger bottles. The smaller bottles can be loaded into sections designed for the larger bottles. On the other hand, the precooling shelf can also be used for quarts as well as for tie-in items like chocolate bars. When used as a "wet" cooler the unit has a six-case bottle capacity.

The dry cooler offers to the customer a cold-dry sparkling bottle. It means less work for the dealer due to the fact that drainage of water due to condensation is infrequently required.

### Some of the Features

Designed for economical operation, the all-welded cabinet has the following outstanding features:

1. Visual seller Thermopane Tuf-Flex glass lid prevents fogging, permits customers to see the beverages appetizingly on display and creates "impulse buying." The extra insulation results in more economical operation.
2. Interior illumination is provided by an economical 7-watt bulb.
3. Stainless steel cooling tank insures long life and it is easy to clean, sanitary and rust-proof.
4. The Kelvinator power unit is hermetically sealed.
5. The rugged drawn steel cabinet is of sturdy construction.
6. The cabinet is insulated with fiber glass on sides, front and top and Celotex on bottom. Insulation is hermetically sealed.
7. Counter-balanced lid mechanism permits finger-tip control.
8. "Utility" precooling shelf is useful for extra cold storage space.

9. Recessed sides and front permit maximum bottle storage capacity with minimum use of valuable storage space.

10. Cushion-sealed lid top effectively seals inner tank against outside atmosphere.

11. Sturdy hot-dipped galvanized steel bottom rack protects inner tank bottom from wear.

12. Stainless steel bottom evaporator, connected with extra side wrap-around coils, permits faster cooling.

13. Heavy gage, welded bottom plate supports and completely seals insulation.

14. Large size, sturdy fiber casters are built for rough use.

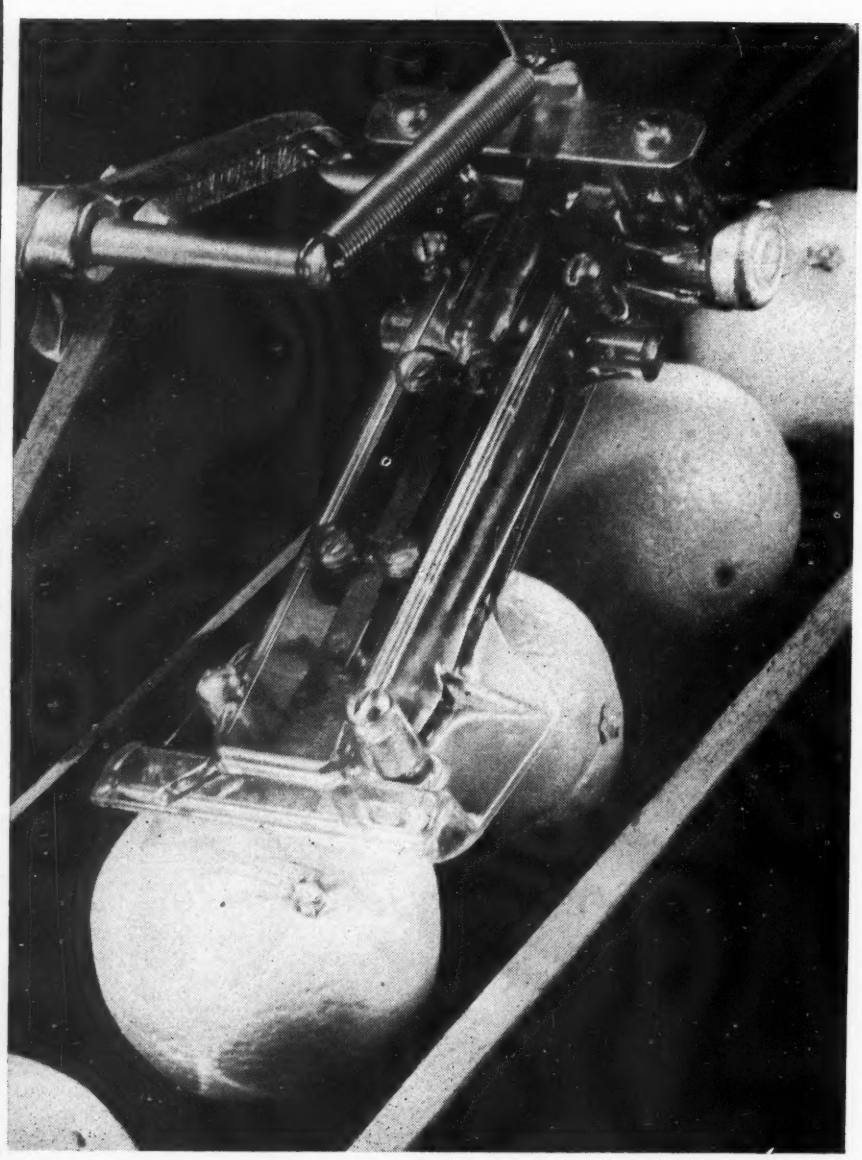
15. Etched, stainless steel, "serve yourself" hand plate protects finish of the box at the point where most usage occurs.

16. Extra large crown receptacle is easily removed for disposal of crowns. A readily accessible faucet and hose outlet contains a heavy duty "Star X" crown puller and is enclosed and tamperproof.

Models are obtainable in Canada Dry green and Spur white backgrounds. Units are sold outright, and an easy budget plan is available. Sale of coolers is not restricted. Thousands of coolers are now being profitably used by grocery and confectionery stores, service stations, country clubs, and recreation centers like bowling alleys. Coolers may be used for soft drinks other than those manufactured by Canada Dry.

# Plastic Makes Ideal Counter

## New molded paddle device assures accurate counting of eggs and fruit



**Key to high speed fruit counts is a light-weight, transparent, plastic paddle or finger of Tenite now being used by West Coast packers. Light weight and toughness are the two principal characteristics of Tenite which led to its use in the paddle by Food Machinery Corp., Los Angeles. The plastic, a cellulose acetate butyrate, is molded by Southern Plastics Co., of Los Angeles. Tenite is made by Tennessee Eastman Corp., Kingsport, Tenn.**

**The electrical apparatus contained within the paddle records the number of fruit counted by the paddle. As many as 50,000 oranges or grapefruit a day may be counted as they are conveyed over a moving belt. Similar paddles are also being used for the delicate job of counting eggs.**

**The 2½-oz. paddle withstands the repeated vibrations and impacts it receives from fast-traveling fruit, without appreciable wear. Since it is light-weight, only slight pressure is required to prevent the paddle from bouncing after it is struck. This assures accurate counting and recording. Unlike wood, metal or other types of plastics tried, it does not splinter, break, bruise fruit or bounce and miss count.**

**The Tenite parts stand up well under continual use. Screw holes are drilled in the tough plastic so that the housing and cover may be fastened together. Electrical parts are tapped in during final assembly.**

**SWEET POTATO FLOUR** makes good layer cake, fruit cake, Southern brown bread, cookies, biscuits, muffins, icings and milkshakes.

# Baking With Sweet Potato Flour

## Cakes have improved flavor and texture when sweet potato flour is used to replace part of eggs, butter and sugar. Icings remain fresh longer

By L. M. WARE, HUBERT HARRIS and MILDRED S. VAN de MARK*
Alabama Agricultural Experiment Station, Auburn, Alabama

AMONG new products coming from the research program of the Alabama Agricultural Experiment Station to develop new uses for sweet potatoes is a fully cooked flour named "Alamalt." The properties, uses, and method of preparation of this flour are quite different from those of flour prepared from dehydrated sweet potatoes.

Alamalt is prepared by baking the potato until fully cooked, peeling, pulping, extruding the pulp onto an enamel tray, drying, toasting, and finally grinding the toasted product in a burr mill. The flour from dehydrated sweet potatoes is made by reducing the dehydrated product, usually the off-color grades, to a flour by use of a hammer mill.

Alamalt is a light yellow flour, containing about 97 to 98 percent solids. When moistened, it turns to a deep orange brown color. On exposure to air, it absorbs and holds moisture. The moisture-holding property makes it especially good in cakes, muffins and soft cookies, since these properties are imparted to the final products.

### Used in Bakery Items

Alamalt has been found especially good in fruit cakes, layer cakes, Southern brown bread, cookies, biscuits, muffins, icings and pies. It may replace a portion of the eggs, butter and sugar in cakes without any loss of color, flavor or texture, and at considerable savings in cost. Cakes prepared in this way have a rich creamy flavor, are fine in texture and grain, have an elastic quality and hold moisture about twice as long as plain cakes. A clear orange yellow color is given to light-colored cakes.

Icings to which Alamalt is added are smooth and creamy in texture and retain freshness for a much longer period than those not containing it.

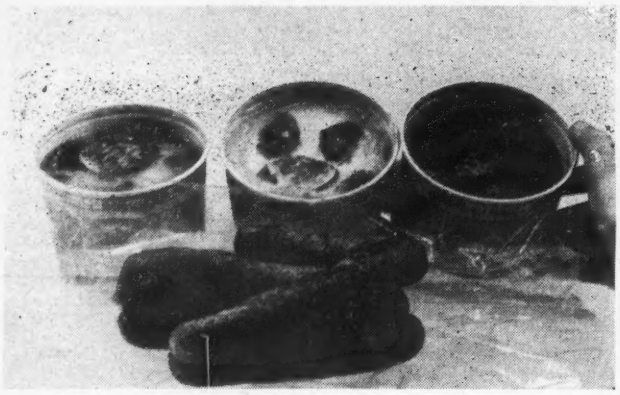
Alamalt may be used for making pies. Opinions as to the quality of pies from the flour differ. There are some who claim that the pie is the best they have ever eaten; others claim it is a little too strong in flavor and dark in color. In the writers' opinion, pies made from frozen sweet potato puree are superior to those made from the flour.

The amount of potato flour added to bakery products is not large. If, however, the trade comes to accept sweet potato flour as an ingredient in cakes and icings, it would consume vast quantities. Each pound of the flour consumed would represent 5 to 6 pounds of cured potatoes and it is of high importance to the grower, the shipper, and the manufacturer that off-grade potatoes make just as satisfactory a product as No. 1 potatoes provided they are sound and well cured.

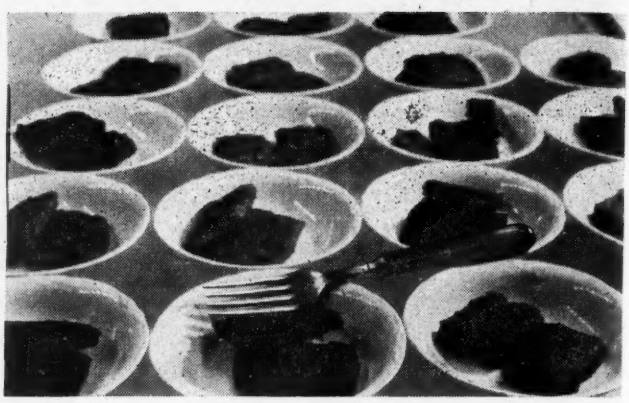
Alamalt does offer commercial possibilities in the preparation of a pre-mixed pie base. This product may be packaged in consumer pack-

(*Continued on page* 200)

*Formerly of the Station staff.



PREHEATING and covering patties with cooking fat reduced oxidative rancidity and prolonged the shelf-life of frozen sausage.

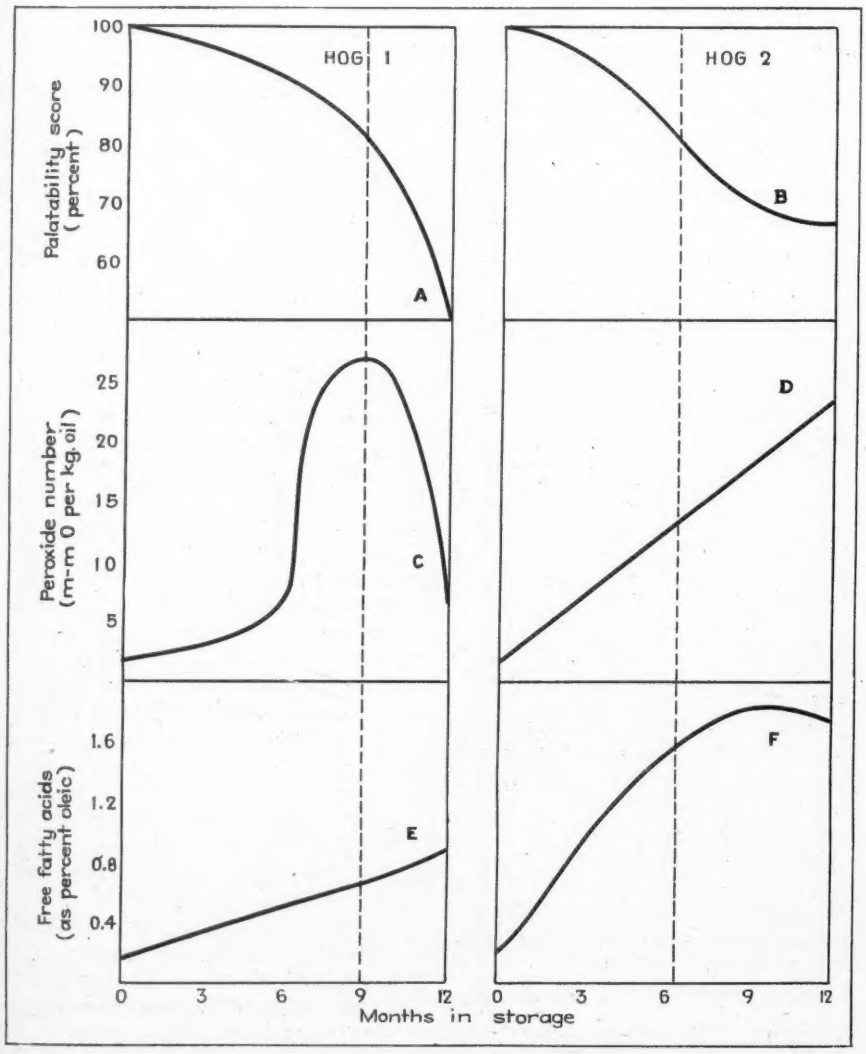


SAMPLES of cooked pork sausage patties. Sausages are scored on the basis of color, appearance, aroma, flavor and texture.

# Controlling Rancidity

## Preheating retarded rancidity, "Avenex" prevented it. Lecithin was ineffective.

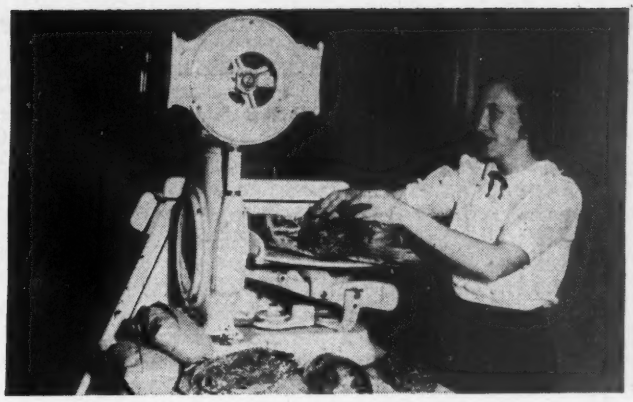
By IDA ATKINSON, S. R. CECIL, J. G. WOODROOF




KEEPING QUALITY differences of frozen pork sausage prepared from two hogs. Storage life at 0 deg. F. is indicated by the vertical broken lines, each crossing the palatability curve at 80. The quality of sausage from hog 1 was good after six months, but declined rapidly after the ninth month, as shown by a sudden drop in palatability score (curve A) and in the peroxide number (curve C). Induction period for peroxide formation was about six months, after which peroxides formed rapidly, reached the peak at nine months, and then decreased, while end-products of oxidation rapidly produced a rancid flavor. Free fatty acids (curve E) also increased slightly more rapidly after nine months but did not reach one percent, which was considered the threshold of rancidity for pork sausage. Sausage from hog 2 retained its high quality for much less than six months. Decrease in palatability was fairly regular (curve B,) as was the increase in peroxides (curve D). The oxidation curve, however, did not reach a peak. Free fatty acids increased rapidly (curve F). After six months free fatty acid values were 1.5 percent, which was probably the reason for the rapid decline in palatability. These graphs show that rancidity from oxidation (peroxide number) and from hydrolysis (free fatty acids) did not occur simultaneously.

This is the last of two articles on factors that influence the storage life of frozen pork sausage. The first article, which appeared in the September issue of FOOD INDUSTRIES, showed how fat content, curing, added beef, types and amount of seasoning and smoking affected keeping quality of frozen sausage.—The Editors.

**WRAPPED** in locker paper, aluminum foil, Cellophane and Pliofilm, sausage is ready for shelf-life test.



**WEIGHING** sausages to desired weight and wrapping them with aluminum foil, Pliofilm or moisture-vaporproof Cellophane.

# In Frozen Sausage Meat

## Adequate packaging and low temperature freezer storage extended storage life

and ETHYL SHELOR, Georgia Experiment Station, Experiment, Ga.

EXTENSION of the shelf-life of frozen pork sausage is now possible by the addition of antioxidants, proper choice of packaging materials, adequate packaging and storage at 0 deg. F., or lower.

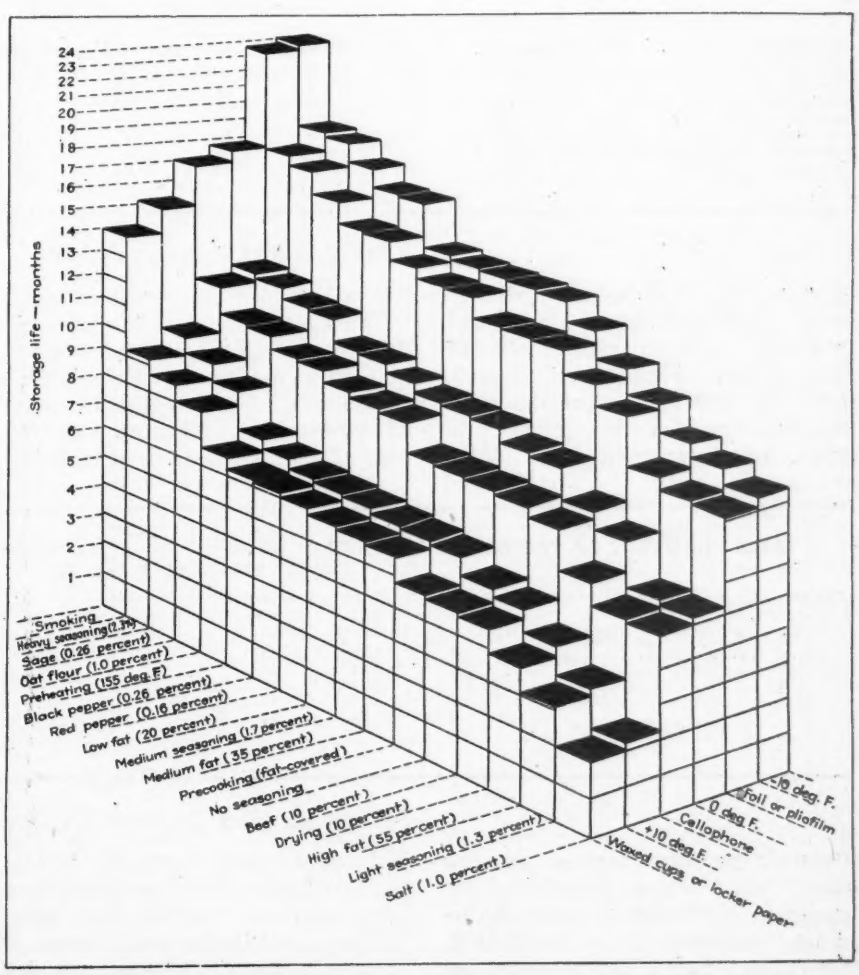
Tests were made to determine the amounts of the antioxidants, oat flour and commercial soybean lecithin, required to retard rancidification. In addition to mixing each antioxidant with sausage, a lecithin-lard mixture was applied as a coating on the sausage.

Sausages were also preheated at 155 deg. F. for different lengths of time to see what effect enzyme inactivation had on retarding rancidification. Similar tests were made on completely cooked sausage.

Different packages were used to find out how packaging affected the storage life of sausages. The effect of storing frozen sausage at different temperatures for varying lengths of time was also studied.

### Acknowledgments

This investigation was sponsored by the Georgia Experiment Station with the cooperation of the Tennessee Valley Authority. Pork used for the sausage was furnished by the Dept. of Animal Industry, Georgia Experiment Station. This report is published with the approval of the Director, as Technical Paper No. 171, Journal Series, Ga. Experiment Station.




**STORAGE LIFE** of frozen sausage varied from two to 24 months, depending upon the meat selected, type of package, whether or not it was smoked and storage temperature. Diagrammatic illustration summarizes the relationship between these factors.

## Tables Show How Seven Factors Affect Stored, Frozen Sausage

**TABLE I—EFFECT OF OAT FLOUR Added to Seasoned Sausage on Palatability and Chemical Rancidity After 9 and 12 Months' Storage at 0 deg. F.**

| Oat flour, percent | Storage, mos. | Palatability score, percent | Peroxide number | Free fatty acids (as oleic), percent |
|---|---|---|---|---|
| 0.0 | 0 | 100 | 0.79 | 0.38 |
| 0.0 | 9 | 100 | 4.30 | 0.55 |
| 0.0 | 12 | 90 | 6.00 | 0.59 |
| 0.5 | 0 | 98 (slightly gummy) | 0.79 | 0.37 |
| 0.5 | 9 | 100 (excellent texture) | 1.52 | 0.39 |
| 0.5 | 12 | 90 (bland) | 2.20 | 0.42 |
| 1.0 | 0 | 96 (gummy) | 0.77 | 0.59 |
| 1.0 | 9 | 98 (very good texture) | 0.98 | 0.60 |
| 1.0 | 12 | 84 (bland) | 0.50 | 0.66 |
| 2.0 | 0 | 90 (gummy; starchy taste) | 0.74 | 0.65 |
| 2.0 | 9 | 84 (gummy; slight starch and bland flavor) | 0.57 | 0.67 |
| 2.0 | 12 | 79 (very bland) | 0.20 | 0.74 |

### Oat Flour and Keeping Quality

OAT flour was added to sausage to determine its effect on preventing rancidity. Lots of seasoned sausage were prepared with 0.5, 1.0 and 2.0 percent oat flour.* One lot was made up without oat flour. All samples were shaped into rolls, wrapped in Pliofilm and frozen.

Cooked, unfrozen sausage with 0.5 percent oat flour had a slight gummy texture. The texture was objectionably gummy with two percent oat flour. The color became lighter and the taste was starchy with increasing amounts of oat flour.

Table I shows that small amounts of oat flour prevented rancidity after 12 months' storage. While two percent oat flour stopped rancidity, this amount could not be used because the texture was too gummy and the flavor was too starchy.

*Supplied by Musher Foundation and manufactured by Quaker Oats Co. under the trade name Avenex.

**TABLE II—EFFECT OF LECITHIN as an Additive and Coating on Palatability and Chemical Rancidity of Sausage After 9 and 12 Months' Storage at 0 deg. F.**

| Lecithin application | Lecithin, percent | Palatability score | | | Peroxide number | | | Free fatty acids (as oleic), | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 0 mos. percent | 9 mos. percent | 12 mos. percent | 0 mos. | 9 mos. | 12 mos. | 0 mos. percent | 9 mos. percent | 12 mos. percent |
| None | 0 | 100 | 100 | 90 | 0.8 | 4.3 | 6.0 | 0.38 | 0.55 | 0.59 |
| Additive | 0.05 | 100 | 99 | 76 | 0.7 | 6.3 | 6.9 | 0.39 | 0.66 | 0.65 |
| Additive | 0.20 | 97 | 97 | 75 | 0.7 | 6.3 | 9.1 | 0.43 | 0.79 | 0.77 |
| Additive | 0.50 | 97 | 95 | 74 | 0.7 | 7.4 | 7.0 | 0.52 | 1.05 | 0.92 |
| Coating | 0.20 | 100 | 99 | 78 | 1.0 | 4.3 | 7.9 | 0.35 | 0.57 | 0.58 |
| Coating | 0.50 | 100 | 99 | 78 | 1.0 | 4.4 | 7.3 | 0.36 | 0.59 | 0.58 |

### Lecithin and Keeping Quality

COMMERCIAL lecithin has proved to be a good antioxidant for meat products. Consequently, lots of sausage were prepared with 0, 0.05, 0.20 and 0.50 percent of the antioxidant. Samples were shaped into ½-lb. rolls, wrapped in Pliofilm, frozen and held in freezer storage.

Sausages were coated with lecithin by mixing 0.2 and 0.5 percent lecithin in melted lard and dipping frozen rolls of sausage in the melted lard-lecithin mixture. Coated rolls of sausage were then wrapped in Pliofilm after coatings solidified.

Lecithin, applied as an additive or a coating, accelerated oxidation slightly, as shown in Table II. There was no evidence that lecithin prolonged storage life of frozen sausages.

**TABLE III—EFFECT OF PREHEATING SAUSAGE at 155 deg. F. on Palatability and Chemical Rancidity After 9 and 12 Months' Storage at 0 deg. F.**

| Length of treatment, min. | Palatability score | | | Peroxide number | | | Free fatty acids (as oleic), | | |
|---|---|---|---|---|---|---|---|---|---|
| | 0 mos. percent | 9 mos. percent | 12 mos. percent | 0 mos. | 9 mos. | 12 mos. | 0 mos. percent | 9 mos. percent | 12 mos. percent |
| none | 100 | 100 | 90 | 0.8 | 4.3 | 6.0 | 0.38 | 0.55 | 0.59 |
| 5 | 100 | 100 | 91 | 0.9 | 1.7 | 3.2 | 0.34 | 0.53 | 0.54 |
| 7½ | 100 | 100 | 88 (bland) | 0.9 | 1.3 | 1.0 | 0.33 | 0.48 | 0.48 |
| 10 | 100 | 93 | 85 (bland) | 0.9 | 1.9 | 3.2 | 0.35 | 0.49 | 0.52 |
| 15 | 100 | 90 | 81 (very bland) | 1.0 | 1.0 | 0.2 | 0.32 | 0.39 | 0.38 |

### Preheating and Keeping Quality

PREHEATING, blanching or searing have been found beneficial for meats to be frozen or canned, because enzymes are inactivated. Therefore, four lots of seasoned sausage were heated for varying lengths of time in an oven at 155 deg. F. Sausage was spread out in ½-in. layers and heated for 5, 7½, 10 and 15 min. After rapid cooling samples were formed into rolls, wrapped in Pliofilm and frozen.

Data in Table III show that preheating prevented rancidity after 9 and 12 months' storage. Heat-treatment for 5 min. was not as favorable as 7½ min. of heating because the peroxide and free fatty acid values were higher. Preheating for 7½ min. was desirable since rancidity was retarded and loss of sausage flavor was less than in samples provided with more heat-treatment.

TABLE IV—EFFECT OF PRECOOKING on Quality of Sausage After Nine Months' Storage at 0 deg. F.

| Sample | —Palatability score— Exp. 1 percent | Exp. 2 percent | —Peroxide number— Exp. 1 | Exp. 2 | —Free fatty acids (as oleic)— Exp. 1 percent | Exp. 2 percent |
|---|---|---|---|---|---|---|
| Uncooked | 82 | 87 | 15.3 | 23.3 | 0.61 | 2.11 |
| Cooked, packed dry | 66 | 76 | 4.8 | 14.8 | 0.33 | 0.48 |
| Cooked, cover with lard | .. | 82 | .. | 7.9 | .. | 0.33 |
| Cooked, covered with peanut oil | .. | 84 | .. | 7.3 | .. | 0.36 |

## Precooking and Keeping Quality

SINCE preheating was found advantageous, tests were made on the keeping quality of frozen, completely cooked sausage.

Cooked and uncooked lots were made up and packed in paraffin cups. Cooked lots were packed dry or uncovered and covered with peanut oil or lard.

Cooking sausage before freezing is not recommended, since better results have been obtained with frozen, uncooked sausage. Similar results were obtained by cooking or by preheating sausage for 7½ minutes or longer at 155 deg. F. While data in Table IV shows that the peroxide and free fatty acid values were low in cooked sausage, considerable odor and flavor were lost. Flavor and odor losses were due to cooking before freezing, storage and reheating before serving. Dry-packed patties showed more odor and flavor losses and higher peroxide numbers than oil- or lard-covered patties. Slightly better results were found when peanut oil was used to cover frozen pork sausage patties.

TABLE V—EFFECT OF FOUR WRAPPING MATERIALS on Chemical Rancidity of Frozen Sausage Stored for Twelve Months at 0 deg. F.

| Packaging material | Peroxide number | Free fatty acids (as oleic), percent |
|---|---|---|
| Cellophane (3 samples) | 3.7, 7.2, 7.0 | 0.64, 0.65, 0.58 |
| Pliofilm (3 samples) | 3.0, 3.9, 7.9 | 0.62, 0.60, 0.58 |
| Aluminum foil | 1.4 | 0.65 |
| Pliofilm | 2.2 | 0.59 |
| Locker paper | 20.4, 15.4 | 0.77, 1.14 |
| Pliofilm | 9.1, 5.0 | 0.77, 1.13 |
| Pliofilm, inside portion | 1.5 | 0.46 |
| Pliofilm, outside portion | 1.7 | 0.53 |

TABLE VI—EFFECT OF STORAGE TEMPERATURES on Palatability and Chemical Rancidity of Frozen Sausage Stored for 9 and 12 Months.

| Storage, temperature, deg. F. | Length of storage, mos. | Palatability score, percent | Peroxide number | Free fatty acids (as oleic), percent |
|---|---|---|---|---|
| +10 | 9 | 75 | 24.0 | 1.99 |
| | 12 | 71 | 13.5 | 1.74 |
| 0 | 9 | 81 | 13.8 | 1.56 |
| | 12 | 72 | 16.0 | 1.49 |
| —10 | 9 | 90 | 9.9 | 1.39 |
| | 12 | 87 | 3.0 | 1.17 |

## Wrapping Materials

SAMPLES of sausage were wrapped in Pliofilm, aluminum foil, Cellophane and locker paper, frozen and stored for one year to determine the effect of different types of packaging materials on keeping quality. Sausages were shaped into rolls, tightly wrapped to exclude air.

Table V summarizes the effects of different wrappers on keeping quality. Aluminum foil (0.0015 gage) provided the best protection, since the peroxide value was 0.8 lower than Pliofilm-wrapped sausage, which ranked second best. The free fatty acid value of Pliofilm-wrapped sausage was slightly higher than that of foil-wrapped sausage. Outside portions of sausage meat wrapped in Pliofilm oxidized faster than inside portions.

Sausage wrapped in 300 MST Cellophane was rated third best because of some evidence of freezer burn. Locker paper was rated fourth because of weight losses, presence of a gray color, high peroxide numbers, perviousness to moisture and flavors and difficulty in fitting closely to the sausage.

## Storage Temperatures

SAUSAGES were held at –10, 0 and 10 deg. F. for 9 and 12 months to determine the effect of storage temperatures on keeping quality. Palatability scores, peroxide numbers and free fatty acid values were averaged and are shown in table VI.

Lowering the storage temperature improved the quality of the sausage, as shown in table VI. Differences in palatability scores between different storage temperatures were greater after 12 than 9 months. Free fatty acids increased consistently with each increase in temperature, but generally declined between the ninth and twelfth months.

Sausage stored at –10 deg. F. scored 15 points higher in palatability than sausage stored at 10 deg. F. after 9 months, and 16 points higher after 12 months. Peroxide values were less than one-half as great after 9 months and less than one-fourth as great after 12 months. By lowering storage temperature from 10 deg. F. to –10 deg. F., storage life of frozen sausage was extended at least three months.

TABLE VII—EFFECT OF STORAGE TIME on Palatability and Chemical Rancidity of Sausage from Two Hogs Stored at 0 deg. F.

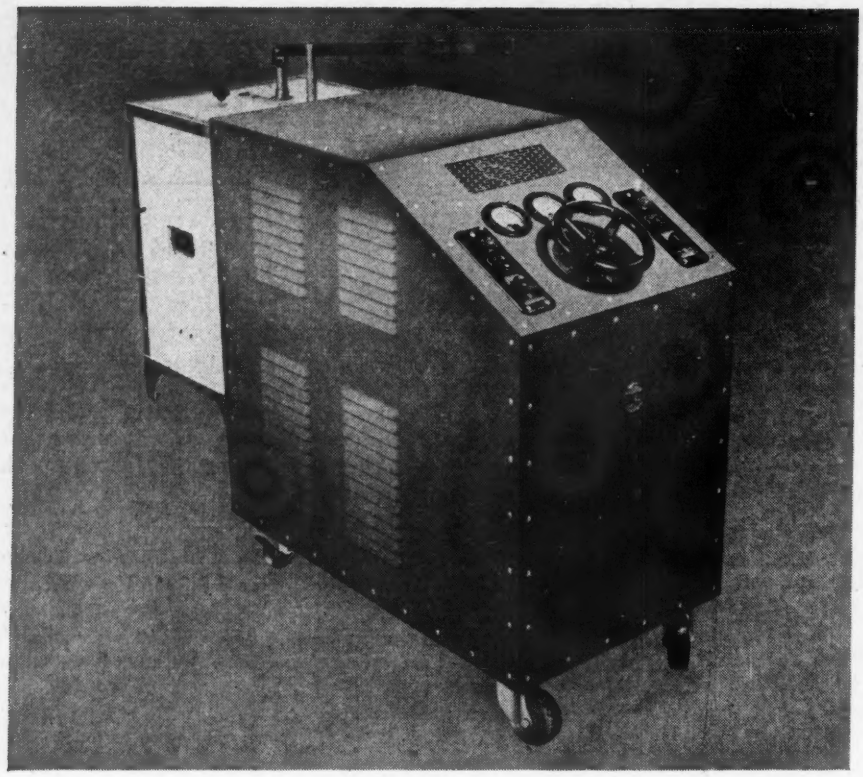
| Samples | ——Palatability score—— 6 mos. percent | 9 mos. percent | 12 mos. percent | ——Peroxide number—— 6 mos. | 9 mos. | 12 mos. | —Free fatty acids (as oleic)— 6 mos. percent | 9 mos. percent | 12 mos. percent |
|---|---|---|---|---|---|---|---|---|---|
| Hog 1 | 92 | 80 | 50 | 4.8 | 27.0 | 7.9 | 0.48 | 0.60 | 0.85 |
| Hog 2 | 82 | 67 | 66 | .. | 18.0 | 23.0 | .. | 1.77 | 1.74 |

## Storage Time

ABOUT a dozen samples of sausage were prepared from two hogs, packed in paraffined cartons, frozen and stored for 6, 9 and 12 months at 0 deg. F. For average palatability scores, peroxide numbers and free fatty acid values, see table VII.

Sausage prepared from hog No. 1 was acceptable after 9 months. After one year, it became rancid and unacceptable. The peroxide number was highest after 9 months, decreasing after 12 months. Free fatty acid values increased only slightly. After six months, sausage prepared from hog No. 2 was rancid and unacceptable.

Storage life of sausage prepared from different hogs may vary as much as three to six months. Other data, however, showed that quality was retained for one year when sausage was prepared from hog No. 2, packaged in Pliofilm and stored at –10 deg. F. Therefore, regardless of feeding and finish of a hog, frozen sausage may have a storage life of one year, if properly packaged and handled.



RADIO FREQUENCY generator for blanching vegetables. Dielectric heater was used with oscillator, with possible power output of 750 watts at 150 megacycles.

FLUME has five, parallel 8-ft. troughs, with connecting return bends.

# Cooling After Water And

## Use of a stream of refrigerated air seems to be more suitable for cooling

By JAMES C. MOYER and KENNETH C. HOLGATE
New York State Agricultural Experiment Station, Geneva, N. Y.

DURING experiments on the blanching of vegetables by dielectric heating, it was found that the flavor and vitamin C contents were adversely affected if the material was not cooled rapidly after blanching.[1] To provide this rapid cooling, three methods were considered, namely: Fluming, water sprays and a refrigerated air stream. Of these three methods, air cooling seemed to offer the greatest possibility for heat removal without the attendant losses of soluble constituents through leaching. In this regard, Cruess[2] observed that an air movement of 800 to 1000 ft. per min. at room temperature was sufficient to cool blanched apples and vegetables within four minutes. He also noted that when similarly blanched samples were cooled under water there was a marked reduction in the solids contents of the expressed juices which was not evident in the air-cooled samples. The use of rapidly moving refrigerated air should further increase the rate of cooling.

While this investigation was primarily concerned with the choice of a suitable method for cooling electronically blanched vegetables, it also seemed desirable to observe whether an improvement might be made in the cooling of materials after water blanching. This report deals with the rates of cooling and magnitude of weight losses from blanched and cooled peas, snap beans and lima beans.

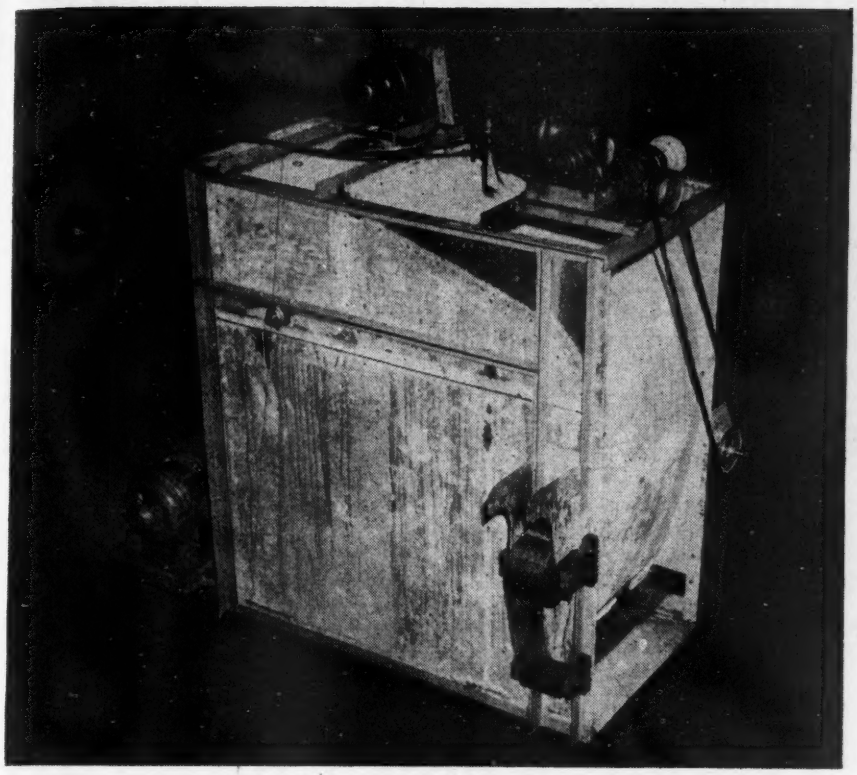
Equipment was constructed on a small scale to duplicate commercial operations. Use of small models required only small amounts of raw material. In addition, units could be readily shifted into position and adjustments made rapidly.

A dielectric heater was used with an oscillator operating at a frequency of 150 megacycles, with a possible output power of 750 watts.[1] The rotary water blancher was constructed according to the reduced scale described by Nelson, Nickerson and Evers.[3]

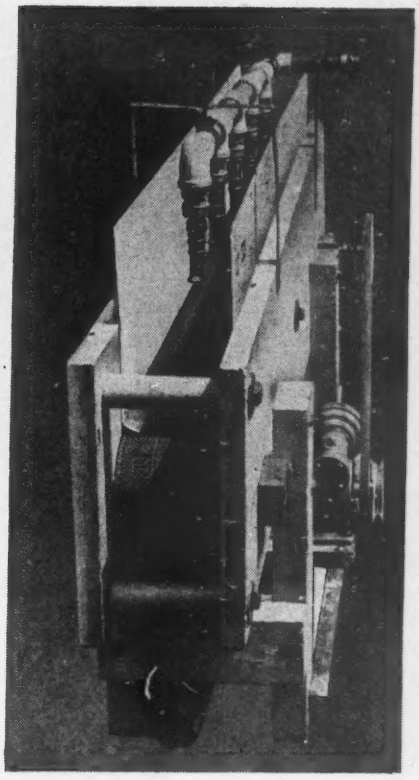
Samples were electronically blanched in end-opening cartons. Blanched samples were then uniformly poured from cartons into the cooling medium. Material was uniformly fed to the water blancher from which it was continuously expelled into the cooling medium.

TABLE I—COOLING RATES of Blanched Vegetables.

| Cooling unit | Distance traveled in cooling unit | Cooling time, sec. | Temperature of cooling unit, deg. F. | Final temperature deg. F. Peas | Cut snap beans | Lima beans |
|---|---|---|---|---|---|---|
| Flume | 8 ft. | 7 | 65 | 125 | 86 | 113 |
| Flume | 24 ft. | 16 | 65 | 95 | 81 | 90 |
| Flume | 40 ft. | 30 | 65 | 83 | 73 | 77 |
| Spray | 17 in. | 15 | 65 | 108 | 88 | 83 |
| Spray | 35 in. | 30 | 65 | 79 | 72 | 80 |
| Air | 23 in. | 90 | 35 | 48 | 49 | 53 |



AIR COOLING unit has a 12-in. multivane fan that delivers air (35 to 38 deg. F.) at the rate of 2000 ft. per min. Vegetables traverse 23-in. belt length in 90 sec.



WATER SPRAYING unit has five garden-hose nozzles suspended over endless belt.

# Electronic Blanching

## electronically blanched vegetables than fluming or water spraying methods

### Cooling by Fluming

The flume was made up of five 8-ft. troughs, arranged in parallel on a continuous slope of ⅛ in. per ft. with connecting return bends. No. 26 gage galvanized iron was formed into a trough 2 in. wide and 3½ in. deep.

A 40 ft. stream of water flowing at the rate of 6.7 gal. per min. was used for cooling. The effect of different amounts of fluming was studied by introducing hot blanched vegetables at 8, 24 and 40 ft. distances from the dischage end. Vegetables were separated from water at the end of the trough with a rod screen made of a series of No. 8 gage galvanized wires, 12 in. long, set at a slope of 9 in. per ft.

### Water Spray Cooling

The water spray cooling unit consisted of an endless belt, made from No. 20 gage, 6 mesh stainless steel wire cloth, 6 in. wide. The belt revolved about two stainless steel drums, 6 in. wide and 6 in. in diameter. Pieces of automobile inner tire tubing were stretched over the face of the drums to increase traction and minimize wear on the wire belt. Although the belt was 6 in. wide, skirtboards reduced the effective width to 4 in.

Five garden-hose nozzles were suspended 5½ in. above the belt, 6½ in. apart. Nozzles were adjusted to fine cone-shaped sprays, delivering 9½ gal. of water per minute onto the belt. The effective length of the belt was 35 in. Vegetables traversed this length in 35 sec. Sides and bottom of the frame were enclosed with No. 24 galvanized iron. A piece of 3-in. conductor pipe was soldered into the bottom for drainage.

**TABLE II—COMPARISON OF LOSSES in Weight During Boiling Water and Dielectric Heating Methods of Blanching.**

| Method of blanching | Cut snap beans* (percent loss) | Lima beans** (percent loss) |
|---|---|---|
| Boiling water | 9 | 4 |
| Electronic | 2 | 2 |

*Blanched 2 min.
**Blanched 4 min.

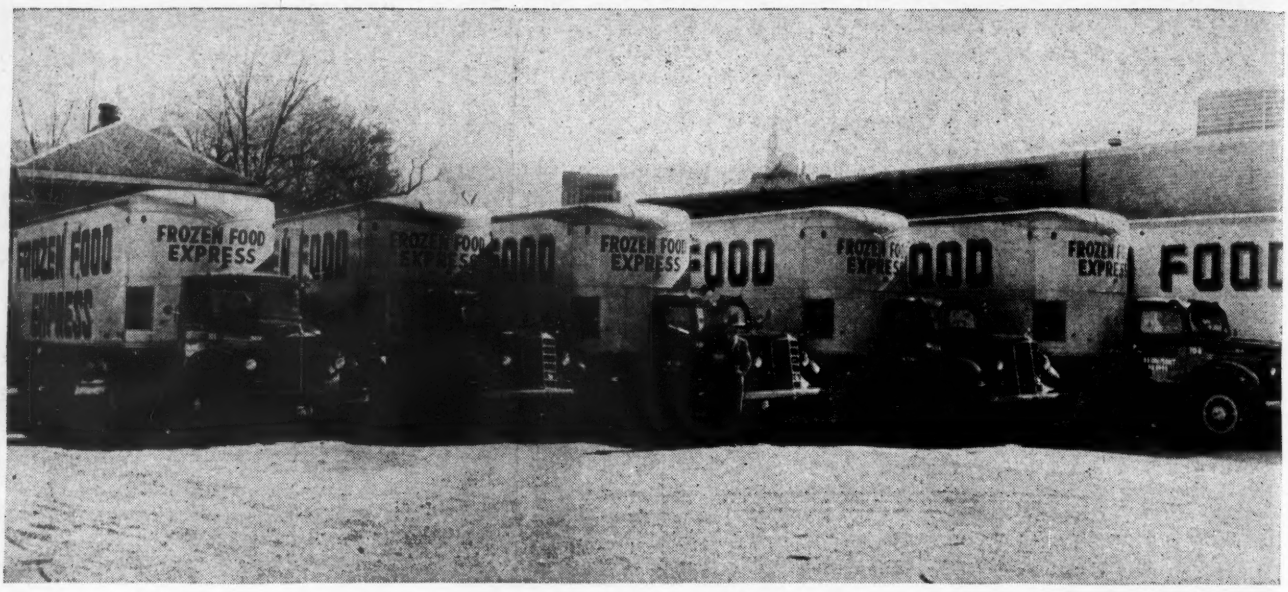
### Refrigerated Air Stream

The air cooling unit consisted of a sheet metal housing, supported by a 1-in. iron frame. A 12-in. multivane fan delivered air (35 deg. to 38 deg. F.) at the rate of 2000 ft. per min. through a duct onto a 10 mesh, No. 24 gage tinned wire belt, 3½ in. wide. Vegetables traversed the 23-in. length of belt in 90 sec.

(*Continued on page* 208)

**TABLE III—PERCENT CHANGES in Weight During Cooling.**

| Cooling unit | Distance traveled in cooling unit | Cooling time, sec. | Cut snap beans: Water blanched | Cut snap beans: Electronic blanched | Lima beans: Water blanched | Lima beans: Electronic blanched |
|---|---|---|---|---|---|---|
| Flume | 8 ft. | 7 | + 5 | +5 | +2 | +3 |
| Flume | 24 ft. | 16 | +13 | +2 | +5 | +6 |
| Flume | 40 ft. | 30 | +12 | +3 | +4 | +6 |
| Spray | 17 in. | 15 | +10 | .. | +3 | .. |
| Spray | 35 in. | 30 | + 7 | 0 | +6 | +2 |
| Air | 23 in. | 90 | — 5 | —9 | —5 | —8 |




FROZEN FOODS are hauled exclusively by this Dallas fleet of six trailers. The products hold temperatures attained when loaded.

# Food Trucks Keep Loads At

## Texas express company offers fast freight service—

FORMED and licensed by the Interstate Commerce Commission for the haulage of frozen foods exclusively, the Frozen Food Express, Dallas, Tex., may presage a great nationwide development in the quick and safe highway distribution of perishables requiring maintained temperatures of from zero to –5 deg. F. while in transit.

The Frozen Food Express began operations in October, 1945. It is licensed by the Motor Carrier Bureau of the Interstate Commerce Commission as a specialized common carrier to haul frozen foods anywhere in the State of Texas, on irregular routes and irregular schedules. The principal foods carried include frozen fruits, vegetables, poultry, meat and miscellaneous frozen food items. Both full trailer loads and less-trailer-loads are handled.

### Used Common Carriers

The various movements handled by the Frozen Food Express were previously made by railroads and common carrier truck lines. These, however, were not satisfactory because of excessive claims for spoilage. Most of these claims were due to the use of inadequate equipment.

It is recognized that the introduction into actual service of the experimental refrigerator railroad freight car, using liquid anhydrous ammonia to maintain interior temperatures at zero, will greatly improve railroad service. (See FOOD INDUSTRIES, July, p. 80.) Nevertheless the FFE highway transportation still has the advantages of speed in delivery and in pick-up and delivery direct to off-rail points.

### Comparable Rates

At the present time FFE rates are comparable with rail and other truck line charges. The time of delivery is much less than by rail and generally less than by other motor carriers, especially if intermediate terminal load transfers have to be made.

But the most important advantage of FFE service is that it will keep the frozen foods carried at the temperature at which they are loaded and will maintain this temperature to distination, regardless of the length of the route.

The Frozen Food Express service is performed by a fleet of six Mack tractors and Fruehauf tandem-axle semi-trailers. Each is capable of carrying a 30,000 lb. payload. The fleet is shown in an accompanying illustration.

The trailer bodies, which maintain the zero to –5 deg. temperatures, are the standard Fruehauf Trail-Aire models. The refrigerating equipment is mounted in the nose of the trailer, as shown in one of the accompanying illustrations.

The Trail-Aire refrigerating unit is made by the Advance Manufacturing Co., Detroit. It is sold exclusively by the Fruehauf Trailer Co., Detroit, for installation in its refrigerated bodies. This was described in detail in the January, 1946, issue of FOOD INDUSTRIES.

The Trail-Aire is a fully automatic unit consisting of a small four-cylinder V-type gasoline engine, which drives the refrigerant compressor; an evaporator; a condenser, and two fans. One fan circulates the air inside the body and over the evaporator coils. The other draws air from the atmosphere over the condenser coils. Both fans are belt driven from the unit's small gasoline engine.

### Compact Unit

All the components of the Trail-Aire unit, except the evaporator and its fan, are located within a compartment inside the nose of the body. This compartment is reached through the two doors in the trailer nose as shown in the accompanying illustration.

The compartment has a flat top

INSULATED with 6½ in. Fibreglas, the Trail-Aire trailer holds frozen fruits, vegetables and meats at 0 to —5 deg., with outside temperature at 100 deg.

CONTROLS to both the refrigerating unit and the motor can be reached through doors in the trailer's nose.

# Below Zero Temperatures

## including pick-up and delivery to any point in state

inside the body. It is on this top that the evaporator coils and the evaporator fan are mounted to circulate the cold air throughout the body in order to maintain the loaded temperature of the product carried.

### How It Works

In operation, heat from the trailer air is absorbed by the refrigerant when it vaporizes to gas in the evaporator. The gas is then compressed and passed through the condenser. There heat is removed by the outside air drawn through the condenser and the refrigerant returns to its liquid state, ready for another cycle. The inside trailer temperature is controlled automatically by an adjustable thermostat, which can be reached for setting through the trailer nose doors. In addition, a circular dial thermometer is mounted on the outside of the trailer nose so that the temperature inside can be readily determined.

The standard Trail-Aire unit, equipped with a 3 hp. compressor, has a rating of 18,000 B.t.u. per hour output. From tests made by the Fruehauf company, a 28 ft. trailer, insulated with 6½ in. of Fibreglas, will have an actual heat transfer of 9,000 B.t.u. per hour when operating in a 100 deg. outside temperature and holding a 10 deg. inside temperature. Under such temperature conditions it is apparent that the refrigerating unit has a reserve capacity of 100 per cent. This is adequate to hold temperatures of from zero to –5 deg. It must be borne in mind, however, that the refrigerating unit does not attempt to improve the thermal specifications of the loads of frozen foods or ice cream, but simply maintains the products at the same temperatures at which they are loaded.

### Lower Temperatures

When required, even lower temperatures, ranging from –15 to –20 deg. F., may be maintained by the use of a 5 hp. instead of a 3 hp. compressor, with the same 6½ in. Fibreglas trailer insulation. In some cases the conventional evaporator and blower fan, as employed in the FFE vehicles, may be replaced by quick-action evaporator plates. While such extremely low temperature units are not at present commercially available, it is predicted that they will be available in the near future.

### Car Test

**Actual tests of the anhydrous ammonia railroad car, referred to here, resulted in what is regarded as a highly successful performance. Loaded with hard frozen oranges in Tulare County, Calif., the oranges were still hard frozen after ten days, during which time the car moved through an outside atmosphere of 92 deg. F.—The Editors.**

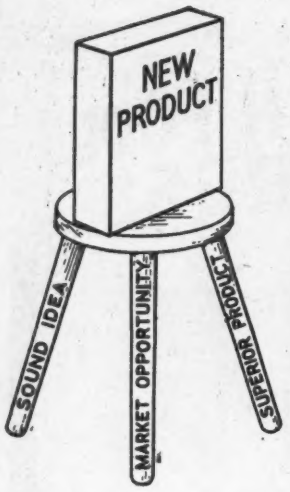
### Cold Blanket

In the operation of the present FFE trailers, the maintenance of the load temperatures is obtained by circulating cold air around and through the load at the rate of 1,800 cu. ft. per min. In fact, the load may be said to be enclosed in a blanket of circulating cold air.

This circulation is accomplished by stacking the load on racks on the trailer floor. The racks permit the air to pass under the bottom tier of the load. Similarly wood strips on the trailer sides permit air to pass along the side of the load. Space is left at the top of the load to permit the passage of air.

The direction of the cold air flow, therefore, is along the ceiling to the rear, down to the floor and back under the load to the evaporator coils at the front.

The gasoline engine that drives the unit has an automatic choke and a full-automatic start-stop push-button switch.




NEW FOOD specialties must rest on substantial 3-cornered base if they are to succeed.

DIRECTOR of new products commercial research, A. E. Burnett (right), confers with W. E. Anklam of the food department. They search for new product ideas and measure their commercial feasibility.

FORMULATING product: Dr. John S. Andrews (right) with Dr. Paul E. Ramstad.

# How General Mills Develops

## General Mills, Inc., uses the proven strategy of paralleling market research

By A. D. HYDE, Vice-President in Charge of Research
General Mills, Inc., Minneapolis, Minn.

TO be successful, a new food specialty must rest upon a substantial three-cornered base consisting of, first, a sound idea; second, a market opportunity; and third, a superior product. Commercial manufacturers who introduce grocery items with any part of that base missing are inviting failure.

Although most food processors recognize these essentials, they often fail to establish them simply because they regard research as a purely technical enterprise. Spot surveys have indicated that many companies depend entirely upon their technical and development staffs for economic information concerning new products, while many others rely on data supplied by an already overworked sales department. Obviously, information so obtained will be sketchy and incomplete, if not actually inaccurate, for technical and sales people generally have neither the time nor the specialized training for effective market analysis.

At General mills we have found that a *complete* research program —including chemical, engineering and specialized market investigation—is the only reasonably sure means of creating new food products that make a worthwhile contribution to the American table and return reasonable profits to the company.

During recent years it has become increasingly clear that America's new frontiers lie in industrial and economic expansion. Today, full employment, an improved standard of living, an increase in national wealth must come through the fuller utilization of raw materials—through the building of new industries, the development of new products.

### Development Policy Stated

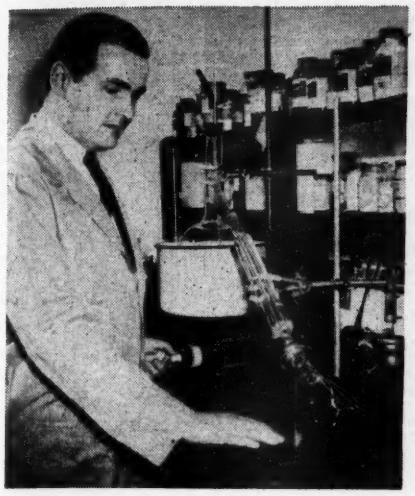
Consequently, the success of a new product, food or non-food, has become important, not only to the individual producer, but to the nation as a whole. Recognizing this fact, General Mills has been steadily reinforcing its laboratory organization, making doubly sure that the base for its new grocery specialties is firm and complete. The company has adopted the policy that "new General Mills products must not only be the very best that science and technology can possibly devise; they must also have a well charted course from the plant to the consumer."

The basic steps used to maintain this policy have evolved from pioneer experience in food development and processing since 1852.

To be effective, all phases of product development must move simultaneously toward a definite goal; formulation, packaging, engineering and market research are complementary, working together like the parts of a machine. At General Mills the organizations which conduct these four phases of development are integral parts of the research department and, consequently, function in close cooperation, guiding each other in the development of the original idea.

That idea, itself, may come from an almost limitless number of sources—from the research staff, from manufacturing personnel, from the sales and advertising departments, from independent consultants, from wholesalers or retailers and many others. But the soundness of all ideas must be established through studies of general consumer tastes and habits, market possibilities and production methods.

Many articles have been written about man's tastes and habits and about means of measuring them. Some are excellent, providing highly useful technics for evaluating desires, buying habits, and so on. But technics are only tools and must be used as such. The tools for measuring consumer taste and habits are valuable only in the hands



FLAVOR is important, involves the chemistry of the new product. Dr. James Evans heads food and carbohydrate section.

TASTE panels include 20 to 30 laboratory employees, shown here evaluating pies made with General Mills Apple Pyequick.

CONSUMER testing of new specialties guides product development work. "Sip and Snack" bars are in major cities.

# Its New Food Specialties

## and product development. This method may take time but it guarantees success

of workers who understand the basic nature of the things they seek to measure.

And what is that basic nature? For practical purposes, it may be summed up in one word—dynamic. Some philosophers tell us that people never change or that if they do, they change slowly. Basically, the philosophers are probably right, but the food processor who takes them too literally is headed for the oblivion of bankruptcy.

### Changing Habits of Living

People, as consumers, do change; they wear different clothes; they drive different cars; they play different games; they eat different foods. Yesterday's matinee idol is today's "has been." The "Flapper" of the '20's became the sophisticated "Junior Miss" of the '30's, and the "Bobby Soxer" of the '40's —and with each change of name she changed her habits of living.

Today, the average man spends less time at hard physical labor than did his prototype of 25 years ago. Furthermore, both he and his wife have been made "vitamin conscious" by a barrage of worthwhile but equally prolific propaganda. Meat and potatoes are no longer enough; they demand that these staples be accompanied by a wide variety of "protective foods"—citrus fruits, leafy green and yellow vegetables, dairy products, eggs, and bread made from enriched flour.

Perhaps one of the best indications that man, as a food consumer, does change is the United States Department of Agriculture's comparison of United States food consumption during World Wars I and II—similar periods historically. This study showed that the average American ate from 10 to 15 percent more in 1942-45 than he did in 1917-18. However, while he consumed twice as much citrus fruit and tomatoes and half again as many leafy green and yellow vegetables, he reduced by one-fifth his consumption of potatoes (Irish and sweet). These are cold figures, but they indicate a change in dietary habit, and there is no reason to believe they will not be followed by other changes of equal significance to the food processor.

Obviously, the considerations mentioned here are but a few of the factors influencing consumer taste and habit; they represent a small cross-section of an extremely complex pattern. The pattern in its entirety presents a riddle which the food producer cannot solve completely but which he must solve partially if he hopes for success.

### Cheerios Took 10 Years for Development

As a highly simplified example of how these factors may be used to develop and establish the soundness of an idea, take the story of Cheerios, General Mills' ready-to-eat oat cereal. In the early 1930's, market analysis confirmed our observation that rolled oats as a porridge was one of America's most popular breakfast dishes. It also indicated that the American housewife was becoming increasingly interested in ready-to-eat foods; she was socially more active than ever before. Often she did a full day's work outside the home, and she both wanted and needed to escape the long hours of "KP" which were accepted by her mother. Since no ready-to-eat oat cereal was then on the market, the Cheerios idea appeared sound. Time has shown that it was.

Actually, of course, Cheerios was not born that simply. Although the product was conceived shortly after the turn of the '30's, it was not ready for the market until 1941, nearly 10 years later. It came into being amidst the pain and effort of

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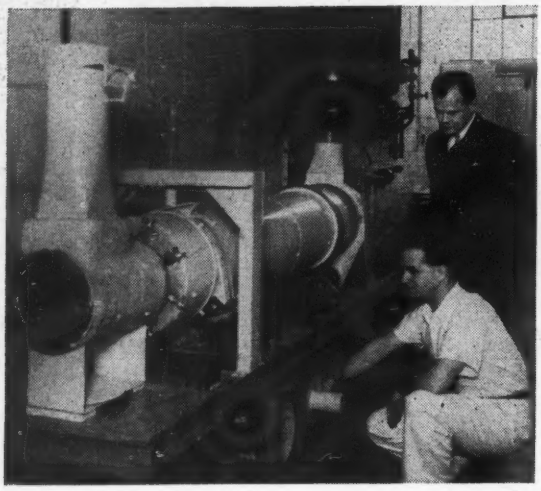
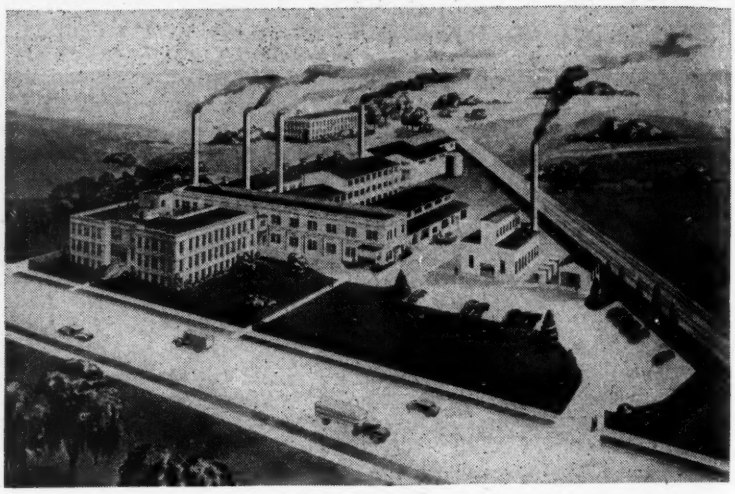
**This is the first of two articles on the General Mills method of creating and establishing new processed foods. Three G. M. I. outstanding successes are Cheerios, Apple Pyequick and Betty Crocker Pea Soup. In this month's article, the author shows how the company decides on what the new product is going to be. In his second article, to appear in a forthcoming issue, he will discuss the perfecting and quantity production of the new product.—The Editors.**

## Chemical, Engineering and Market Research Help Create New Foods



PILOT PLANT aids product development and also determines engineering data for commercial process.



LABORATORIES now under construction will give General Mills a total of 100,000 square feet of floor space for its expanded research program.

careful development and economic research, and the idea was examined in the light of detailed market analysis.

That all ideas must be so examined is the fact most often overlooked by the food manufacturer. He frequently will study the economic factors relating to production; he will determine the materials he needs; find out where he can buy them and how much they will cost. He will assure himself an adequate supply of labor and learn whether or not he can handle the new product with present plant facilities and equipment. Yet he may have only a hazy idea of how he will move his product from the plant to the dining room table—if, indeed, he has any idea at all.

### Lack of Market Opportunity May Mean Failure

Since a market opportunity is the second corner of the triangular base vital to a new grocery product, failure to establish it beyond doubt can easily lead to economic disaster.

Accurately speaking, market research (or New Products Commercial Research, as we term it at General Mills) is a continuous process. It keeps its finger on the public pulse, ready to detect changes in taste and habit which suggest new product ideas. When it uncovers an idea, it measures that idea against the yardstick of economic feasibility. It helps guide chemical and engineering research during product development, and finally, it determines how that product may best be sold. Each phase merges with the next, and there is no clear line of demarkation between them. Since, however, we are momentarily concerned with "establishing the soundness of ideas," let's consider market research's role in determining economic feasibility.

### Will It Be Profitable?

In the mind of every food manufacturer (and in the mind of every other manufacturer, for that matter) one question is predominant: "Will my product make money?" Unfortunately, that question can never be answered with complete certainty; the factors involved are too numerous and complex. However, it can be answered with a minimum of doubt if we know how many people may want or need the product, who and where those people are, how much they can afford to pay and how much it will cost to produce and market.

Aside from the special technics developed by all active market research organizations and guarded as valuable "trade secrets," the basic procedures for answering these questions are standard. Through business literature, they are available to the food processor, large or small, and he need only adapt them to his own individualized operation. In addition, he has at his finger tips the myriad United States Government publications, listed in "Market Research Sources," the "List of Publications of the United States Department of Commerce," general government price lists and many other releases.

### Skeleton Check List

The important thing is not how these questions are answered, but that they *be* answered, accurately and completely. General Mills has found the following skeleton checklist helpful in evaluating the market potential, production possibilities and consumer acceptance of a new food product. It is neither original nor all-inclusive; rather it is a compilation which, when backed by the technics of our experienced research organization, has yielded accurate results.

- Markets and Market Potentials
  - Size of market and estimated potential in dollars or cases for proposed or newly developed product
  - Character of the market
  - Habits of potential user
  - Market trends
- Competition
  - Competitive products, direct and indirect
  - Competitive companies, policies, success
- Distribution
  - Analysis of what is involved in distributing the product; channels available
  - How are competive products sold today and why?
- Raw Materials
  - Availability in quantities potentially needed
  - Freedom of market
  - Future outlook
- Investment Required
  - Research and development
  - Building and equipment
  - Inventories required
  - Cost of entering new markets
- Advertising and Promotion
  - Possible advertising and promotional advantages of proposed and/or developed product
  - Advertising claims of competition
  - Advertising expenditures of competitive products and manufacturers
- Packages and Packaging
  - Package size
  - Case size
  - Package use in homes
  - Performance tests
- Prices and Margins
  - Consumer prices
  - Trade prices and margins

(*Continued on page* 212)

# EDITORIALS

LAURENCE V. BURTON, Editor

## Cost of Canning vs. Freezing

INTERESTING data on the cost of home preservation of food has been released by the Agricultural Experiment Station of Massachusetts. Home freezing a pound of food costs from four to five times as much as home canning. The Station folks do not believe in abandoning the use of heat sterilization except for the products where a superior item is produced by freezing.

## Electronic Processes

ELECTRONIC pasteurization and sterilization of food continue to attract attention. Up to now few experimental results have been published save for a spectacular story in *Fortune* in March, 1947, and a few cautious factual reports in FOOD INDUSTRIES.

Efforts of FOOD INDUSTRIES to obtain serious discussions of the subjects by competent men have been unavailing. We are not sure about the reason for the reticence that might be called coy. But word-of-mouth information—or mere gossip—has carried a considerable distance.

So, the little reported here is not to be treated as solid truth, but as rumor. It may be garbled, but it seems to make sense. Which is the reason for writing about it.

There is every reason for wanting electronic methods of processing, provided the new methods are economic. In textile drying the use of dielectric heating has made possible an increase of the productivity of driers by about 25 percent. This increase is possible because the electronic method raises the temperature of the wet textile to the boiling point in a few seconds instead of the time normally required—about 25 percent of the distance traversed inside the drier. The cloth now begins to dry as soon as it enters the drier.

A brewer has tried dielectric pasteurization of beer in a small way but found that arcing took place and the preliminary tests have proved fruitless. Yet if a successful method could be developed the saving of floor space occupied by huge pasteurizers would be ample justification for a considerable investment. For breweries are almost always located where land values are very high.

Instantaneous sterilization by gamma rays from a cyclotron has been reported to be possible in a very tiny way and without regard to its cost. The process, however, is said to leave the product uncooked, which could be in its favor. But there seem to be many obstacles that may not be easily overcome. Some reports have it that the flavor of the food so sterilized is not pleasant.

One experimenter once told us that in a rash moment he tasted irradiated salt and its flavor was "vile." It is now known that salt becomes radioactive by certain electronic treatments. Perhaps this is the reason for the off-flavors reported. One of the problems with radioactive salt is the behavior of some of the impurities in the NaCl. Radioactive sodium chloride has a half life of about two weeks, and thus would soon become inactive. But other radioactive salts may have half lives measured in years. This may explain some of the unpleasant and, no doubt dangerous, contamination.

Aside from the foregoing technical problems, there are the economic problems to be overcome. High speed production of processed food must be maintained. One tale that has come our way is that a surge generator used in certain tests can discharge only once in two seconds—30 times a minute. And the cost of the generator alone would be roughly $150,000. An entire factory operating on time-tested methods could be installed for that cost, and its production line would operate at double or triple that speed. Nevertheless, if flavor advantages, or convenience, or more economical packaging and distribution can be obtained by a new electronic process, a high initial cost may be justified. Another story says to the contrary that surge generators can discharge at 180 times a minute, which speed has commercial possibilities —if the process works.

FOOD INDUSTRIES would be the last to discourage any line of research. Our suggestion is that an economic study of present successful preservation methods should precede costly research so that the experimenters will know in advance whether the goal is worth the effort.

Some day those who know all about the subject may be willing to reveal the facts.

## Business Outlook

BUSINESS is good and will continue to be good, despite the $200,000,000 decline in exports reported by the Department of Commerce. Employment is at an all-time high. Prices are still rising. Wages are going up as strike after strike forces increases. To us it is a period of mild inflation.

If exports ease off enough the ensuing price situation may be slightly lower, beginning with grains and meat animals. The cost of living may ease off enough to end wage increases.

May, 1947, was the low point in many food processors' sales. June showed a pick up. July and August were better. The prophets of gloom have been quiet for a time. The U.S.A. cannot experience a business recession of notable magnitude as long as agriculture is prosperous.

If you care to do your own close-up business forecasting, watch the price of 92-score butter on the New York Mercantile Exchange. Any change in butter prices affects the price the farmer receives for his butterfat about four days later. This is one of the most sensitive business barometers in existence—too sensitive for most uses.

Butter prices won't come down much—as long as consumer buying power is adequate to keep

them up. When butter prices take a real tumble then is the time to look for underlying forces that will spell diminished business.

One big query of the day is why did so many business economists guess wrong? According to many a dire prediction this country should be in a recession right now. One idea, to explain some wrong guesses, is that we are now in an era of experimental economics. The New Deal started it, but its "pump priming" tactics were too small to have notable effects. Today the labor unions, who also employ some very keen economists (CIO for example has more than 60), are experimenting by continually forcing wages to go up to maintain consumer buying power. John L. Lewis has been more brazen about his own policy than most labor leaders.

How much of today's prosperity is due to pent-up consumer demand, and how much can be attributed to continually increasing wages is something for future economic historians to tell us. Nevertheless we feel that appraisals of the future trends of business must reckon with the economic experimenting on a national scale now being carried out by powerful unions.

What the Taft-Hartley law will do to their tinkering is anybody's guess. But meanwhile business continues good.

## Overstaying the Market

MANY a firm played into good luck in 1947, without realizing it. They had overstayed the market on foods of indifferent quality that had existed in the war years. Almost anything could then be sold at a profit, and consumers were glad to take anything they could get. Standards of quality were all but forgotten if, indeed, they were even known. Certain freezers and canners were the most remiss, particularly the newcomers without previous experience in depression days.

When the soft-goods price slump occurred in the autumn of 1946 there was quite a scramble to get out of off-brand and lower quality merchandise. The scramble had the makings of a most unhappy situation for the owners of the goods until weather intervened in 1947. As a result of unfavorable growing weather much of the distress merchandise has become reasonably good property. And it now appears that those who overstayed the wartime markets can get out without important losses.

It would be well, however, for those who have had a close call to take the recent warning to heart. Certain well-known firms with well-known brands and rigid quality standards for their several brands discovered that the public suddenly became very choosy and would buy only their best products. The lower quality brands were not in demand for some time! With this recent warning about the lessened demand for low quality during this inflationary period the big emphasis now is on producing as much top quality merchandise as nature will permit.

Among makers of fabricated foods there has been some earnest heart searching even though adverse growing weather seemingly has failed to bail out this group. For instance, several firms entered the condiment field during the war with moderate success until the soft goods price slump came. Unhappily they had failed to do any sales promotion of their unknown brands (often not well formulated items) and, when the trade began to clean house, the off-brand stuff was even given away by retailers.

While the vagaries of weather have bailed out many primary processors, the secondary processors who fabricate foods have had no such luck.

Any firm that got away with the situation because of the effect of weather should seize the opportunity to revamp production and sales promotion plans. They may not get a second chance.

## Good Intentions Can Go Wrong

ONE man's poison can be another man's meat if the other man is on his toes. So other food processors can well profit from a past unfortunate experience of a processor whose liquid product had been seized by the Food and Drug Administration because it contained fluorine.

There was once an unfortunate experience where a commendable attempt at quality control backfired because it was not carried quite far enough. The processor used a fluorine disinfectant to sanitize tanks and lines, but evidently failed to flush away the fluorine containing residue of the disinfectant before putting the product through the equipment. As a result, some of the liquid food came out with a soluble fluorine content of 15 milligrams per liter.

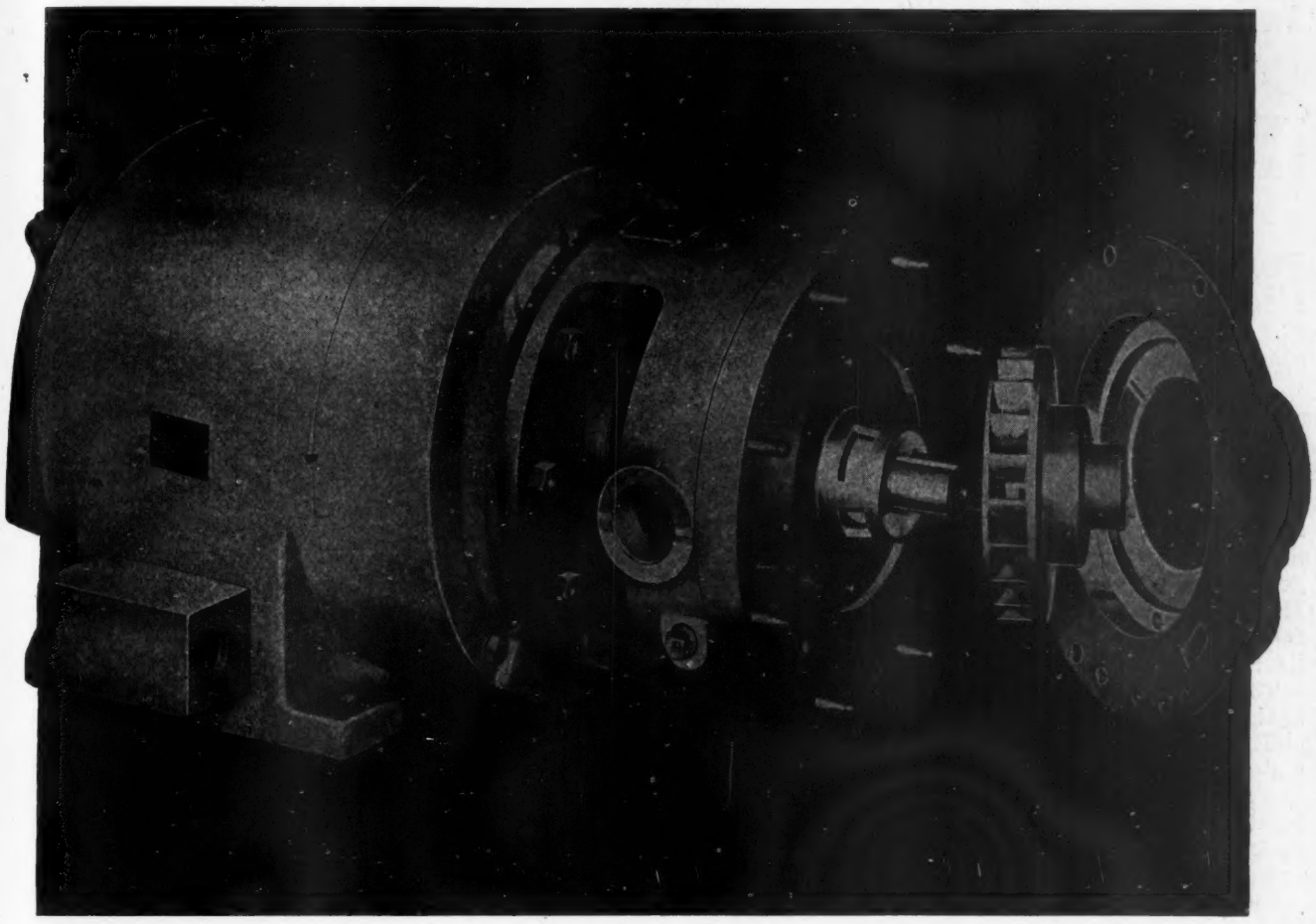
Food processors should never fail to determine all the facts about the materials and the equipment with which their product comes in contact, and then analyze the effect upon the product. Otherwise, they never can tell when some new factor will affect quality. It may be fluorine in a disinfectant, or cadmium in an alloy, or some unexpected property of an ingredient. But in any case it is less expensive to play safe than be sorry.

## Where Co-ops Are Vulnerable

THOSE food processors that fear the future competition of income tax free cooperatives should be informed that their position is not always so enviable as may appear. As long as the co-op processes only the raw materials produced by its own members, it does have a certain tax advantage. But if the co-op goes outside its membership for raw materials, the U. S. Treasury rules that it is engaged in ordinary commercial enterprise and taxes it accordingly.

Not many years ago a small co-op with a large processing plant slipped up on that one, and is now a bona fide corporation with all the rights, privileges and taxes appertaining thereto. It seems the co-op bought outside raw material to keep its plant running at capacity. So by becoming efficient it lost its preferred status.

# The Nash Clean-Air Compressor has but one simple moving part.



The Nash Clean-Air Compressor has but one moving part, cast in one piece and rotating in the pump casing without metallic contact. No internal lubrication is necessary; therefore air or other gas compressed with a Nash is entirely free from oil contamination.

Dust and heat are removed from the air, or gas compressed, by the unique Nash "Liquid Piston". Air from a Nash Compressor is therefore delivered free from dust, heat, or oil, without supplementary filters or air washers, in a perfected mechanical structure with no internal wearing parts.

Air or gas from a Nash Compressor may be used for agitating, blending, maintaining pressure on storage tanks, or moving liquids and materials by pressure displacement, in connection with the most delicate food, beverage, or chemical process, without danger of contamination.

Bulletin D-252 tells all about Nash Clean-Air Compressors, and it is free on request.

## THE NASH ENGINEERING COMPANY

SOUTH NORWALK, CONNECTICUT, U. S. A.

# NEW PACKAGES & PRODUCTS

## Orange Jelly

SOON to reach the nation's food trade is a concentrated orange jelly, first manufactured three years ago for Red Cross use in prisoner of war packages.

The Germans used to puncture every metal container in the prisoner of war packages on the grounds that this was necessary to prevent our soldiers from hoarding food against escape. Thus the concentrated jelly was produced to replace concentrated juice.

Juice Industries, Inc., Dunedin, Fla., the manufacturer, says the product has a distinctive orange flavor, high vitamin C content and the color of pure orange juice.

The product will be packed in 12-oz. reusable glass tumblers.

## Father Time Triumph

HAVING discovered that consumers preferred an old established label and trademark to a modern streamlined design adopted about two years ago, Pillsbury Mills, Inc., Minneapolis, has reverted to the familiar with a modern touch for its new label design.

The new labels were tested against the old design and a third under consideration. The company states that it found that better than two out of three homemakers could identify the company's barrelhead design without the company's name being exposed.

Flour bags were the only package that did not go modern in Pillsbury's comparatively recent redesigning program.

The barrel head, featuring food illustrations to give appetite appeal, now will be used on Pillsbury Sno Sheen cake flour, pancake mix, buckwheat pancake mix, farina, piecrust mix, Minutmix and new products being test-marketed or developed for the future.

## Juice Booster

A LINE of individual, ready-to-serve fruit juices for drug stores, roadside restaurants and iced "pop" boxes recently was announced by H. J. Heinz Co., Pittsburgh.

The juices are packed in 5½ oz. lithographed tins that facilitate chilling and eliminate necessity for bottle returns.

The group will include apple, apricot nectar, grape, grapefruit, blended orange and grapefruit, prune and tomato juices.

## Swift Introduces Two New Shortenings

NEW name, new package and better product—those are the claims made by Swift & Co., Chicago, in presenting its new bland lard. The name—Swift'ning.

Betterment of product is the result of a new manufacturing process developed so that the lard can be used in any recipe calling for shortening—conventional or quick-mix cake making. Swift'ning can be blended at once with all ingredients of a mix.

Addition of minute quantities of gum gualiac, a vegetable substance, prevents oxidation and permits storing without refrigeration. The company also claims that the lard will not smoke at normal frying temperatures.

The product is packaged in a 3-lb. tin and a 1-lb. carton as well as in a 1-lb. folding butter-type carton.

AS an aid in decreasing the number of stale bread returns by bakers and grocers, Swift & Co., Chicago, has introduced a new shortening called Tri-Co.

Packed in 400-lb. drums, 110 and 50-lb. cans, the shortening was developed expressly for bakers for use in bread and other yeast-leavened doughs.

It is a blended shortening containing Esterine, a tenderizing fat developed by the company. Tri-Co is said to modify the dough structure in such a way that absorption is increased, tenderness is improved and keeping quality is prolonged beyond points previously thought possible.

Properties and use of the new blending agent, which is a superglycerinated fat, were described in Food Industries, September, 1947, p. 134.

## Canned Heat Heats Hotcan—No Fire

RESUMPTION of production of Hotcan, a self-heating can, for civilian trade has been announced by the Hotcan Corporation, Los Angeles.

Introduced shortly before the start of the war, civilian manufacture was discontinued due to requirements of the armed forces and to wartime tinplate restrictions.

Hotcan consists of an outer can which almost completely encases an inner can of food or beverage. The outer can has two compartments, one containing a liquid, the other a chemical. When activated by punching through the liquid compartment, the liquid and chemical unite to produce heat without fire or flame. The contents of the inner can are said to heat in 12 minutes for solid foods, 5 for beverages. The inner can must then be opened with a can opener.

Since it made its first appearance on the market, the Hotcan container, opener and label have been improved. The outer container is slimmer. It is a 401x509 size can with a 211x414 inner tin. The opener, attached to each unit, activates and opens the can easily.

The Hotcan labels appear on such products as hamburgers with tomato sauce and mushrooms, beef and gravy, egg noodle and chicken dinner, frankfurters and beans, frankfurters, chicken noodle soup, hot chocolate and coffee.

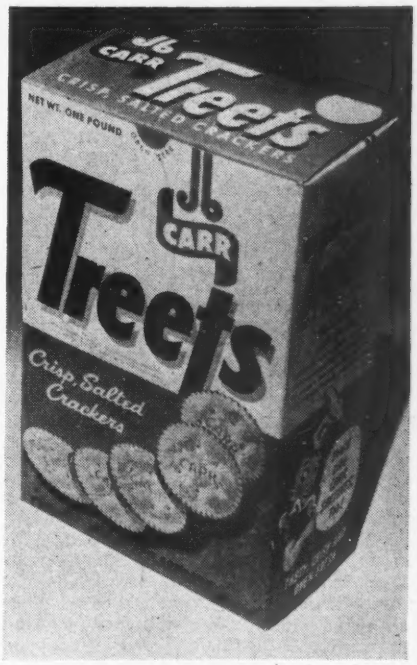
## It's in the Design

TREETS, Carr-Consolidated Biscuit Co.'s salted cracker, is appearing on store shelves in a new dress.

The 4-color carton carries a blue trade name. "Treets" has been enlarged and simplified to stand out on a sheer white background. The rectangular red panel below it reveals the crackers in their natural golden color.

James H. Nash, New York, designed the package which is made of lithographed clay-coated stock by American Coating Mills, Inc.

This package is one of several that has undergone recent redesign in Carr-Consolidated Company's current improvement program.




## Shapely Noodles

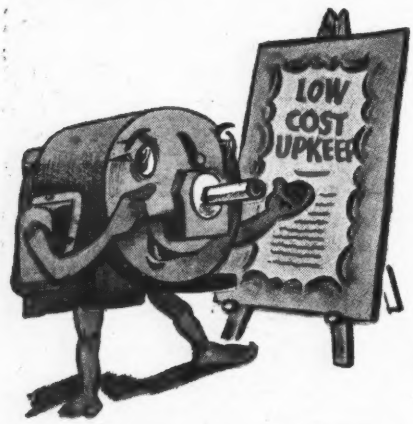
COOK'S Delight Noodle Baskets are being introduced to the national market in a window carton that incorporates convenience, prevention against breakage and ease of stacking.

The egg noodles, fried in hydrogenated oil, are shaped into thin, crisp, basket-like shells. They are packed four to a box and are shipped 24 boxes to a carton.

The processor says that the noodle baskets will not become rancid but, like crackers or potato chips, will in time lose their crispness, which can be regained by heating. They are recommended for both hot and cold dishes, such as Newburgs, salads, berries and ice cream desserts.

Williams West & Witt's Products Co., Chicago, the manufacturer, is in full production at its recently completed plant.

# "Puzzled over which type of motor to buy?"




**In 80% of the Cases,** open squirrel-cage induction motors meet the need. They fit most drives, and can be obtained in numerous standard and special designs to meet varying conditions of starting torque, slip, etc. They are also the most economical type to buy and to maintain. Allis-Chalmers builds induction motors in sizes from ½ to 10,000 hp — or higher, if needed.

**For Tough Starting Conditions,** wound-rotor induction motors are recommended. Their high starting torque, at comparatively low starting current, and their controllable speed characteristics are desirable in drives for conveyors, grinding mills and other tough starting assignments. Compact, accessible Allis-Chalmers wound rotor induction motors range in size from 5 to 10,000 hp.

**For Slow Speed,** direct-connected drives as low as 75 rpm, or other constant speed applications at higher rpm, synchronous motors are a good solution. They are of particular benefit when a system's power factor is low, since they can be furnished for operation at either unity or leading power factor. From 40 hp to 50,000 hp and higher — in bracket bearing, pedestal bearing, or engine types.

**Is d-c Available?** Then adjustable speed operation is easily obtainable. Allis-Chalmers builds d-c motors from ½ to 10,000 hp and higher — for constant or adjustable speed duty in ranges of 6:1 and lower. By means of a source of d-c voltage, adjustable speed motors may also be designed to operate over a speed range as high as 30:1. Suitable for fans, elevators, etc.

## Select from the Complete Allis-Chalmers Line!

NOT JUST FOLLOWING popular choice and using a standard squirrel cage induction motor. But the *right* motor for economy and efficiency.

That means an overall knowledge of *all* types of motors . . . their operation . . . limitations . . . maintenance. And there's where your A-C representative can be a big help. His recommendations are backed by experience . . . and the Allis-Chalmers motor he selects is *itself* backed by 50 years of experience in motor design and building. ALLIS-CHALMERS, MILWAUKEE 1, WIS. A 2304

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PACKAGING DIVISION
E. W. Twitchell Incorporated
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## Dehydrated Spuds

PRECOOKED canned potatoes packed by Speed-Tatoes Products Co., Seattle, recently made their bow on the western market.

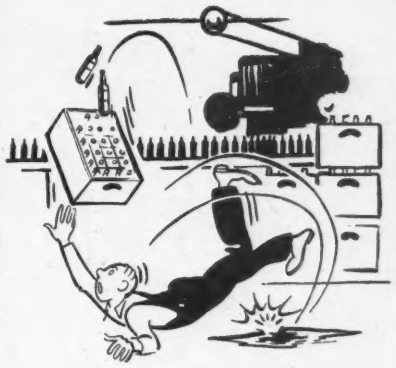
Called Speed-Tatoes, the product is prepared by washing No. 1 potatoes and peeling them with a steam peeler, trimming, cutting in 1-inch slices, cooking 19 minutes in a blancher, ricing at 1800 lbs. pressure and drying for 90 minutes at 150 degrees in drying tunnels. The pieces are broken up into ½- to 1-inch lengths and packaged.

Packed 3½ oz. to a can (said to be equivalent to 1½ lbs. of potatoes), the product is recommended for mashing or hashed browns.

## Self-Service Fryers

IN an effort to increase merchandising and profit possibilities in poultry, Armour and Co., Chicago, has designed a new carton for Cloverbloom Table-Dressed Fryers.

Aimed particularly at self-service cases, the carton is printed in blue and white with a maroon logotype. It has a semi-open face that allows the container to be displayed either closed or open, with the fryer showing through the transparent lining. Each box contains eleven individual pieces of chicken protected by the inner liner.

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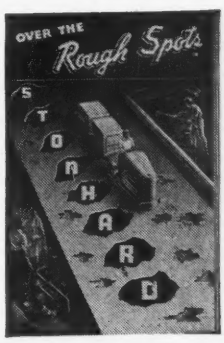


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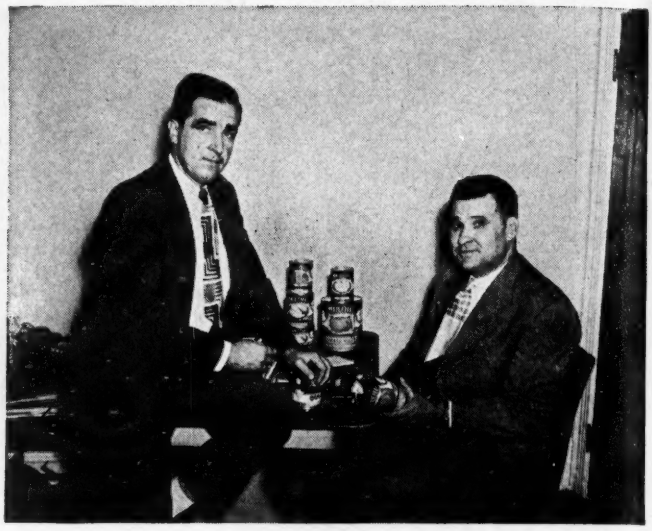
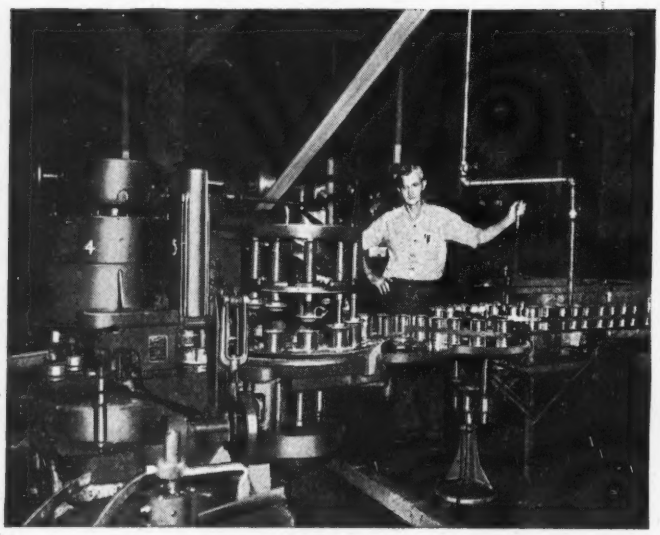
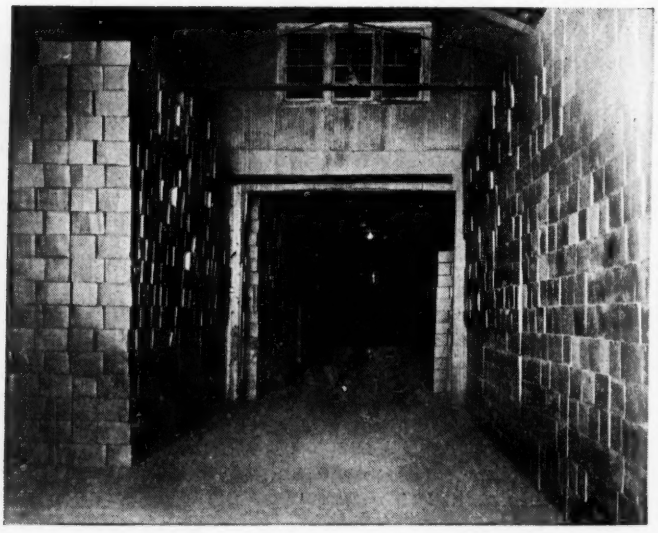


Mr. Leon C. Bulow (right) conferring with S. A. Connor, Crown Can representative, in Mr. Bulow's Bridgeville, Del. office.

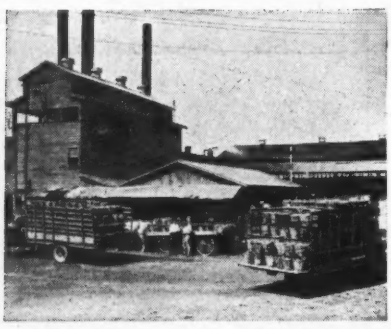
## LEON C. BULOW
## QUALITY PACKER



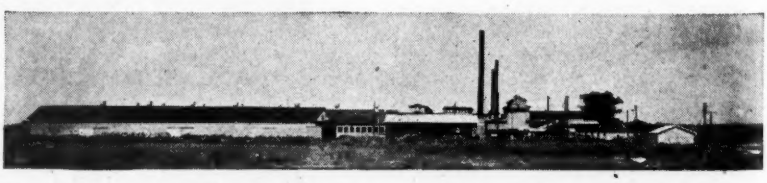
Bert Blades, Crown Can service man, inspecting fast tomato line in the Bulow Plant.



Interior of one of the three large Bulow warehouses at Hynson, Md.



Unloading tomatoes from truck to scalder at the Bulow Plant in Hynson, Md.



The Bulow Plant at Hynson, Md., where sweet potatoes, white potatoes, string beans, tomatoes, tomato purée and tomato juice are packed.

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# FOOD INDUSTRY NEWS

## GENERAL

## Food Processing Developments Are Heard At Chemists' Meeting

PROPER processing may increase the vitamin content of foods, according to a paper prepared by E. F. Kohman and A. A. Rugola, of the Campbell Soup Co., which was presented at the annual meeting of the American Chemical Society, in New York, last month.

In recent experiments with sweet potatoes, the report said, the thiamine content was increased 25 percent when the potatoes were slowly brought to a temperature just below the boiling point. Other vegetables may be found to behave similarly, they said, and each processor must determine how maximum nutrient value may be developed in each food processed by him.

Production of citrus sirups by use of an anion exchange resin that promises a wider field for citrus fruits, was reported by Herbert C. Gore, Scarsdale, N. Y., consulting chemist. The process substantially reduces the acids of orange and grapefruit juices without the formation of salts. Only a small fraction of the ascorbic acid is lost in the operation. Sirup making, the speaker declared, would fit in well with canning operations as the methods employed in juice making could be used.

Polyglucuronic acid, a new derivative of ordinary starch, may find important uses as an organic acid in the food processing industries and in other fields, in the opinion of Prof. Ed. F. Degering and J. E. Pierce, Purdue University. In a series of oxidation studies they obtained an oxidized starch in which the starch molecule is believed to remain undegraded, yet is soluble in dilute alkali.

More mellow, fruitier, and clearer wines are obtained by enriching grapes with additional fruit enzymes, according to a report by W. V. Cruess and J. H. Kilbuck, University of California. Added experimentally to accelerate the clearing of wine, pectinol, a commercial enzyme costing about one-third of a cent per quart of wine, was found to increase the yield of juice by 7 percent in addition to its "aging" properties and contributions to flavor and bouquet. It is also useful in the clearing of other fruit wines.

### Reorganization Plan Approved by Bakers

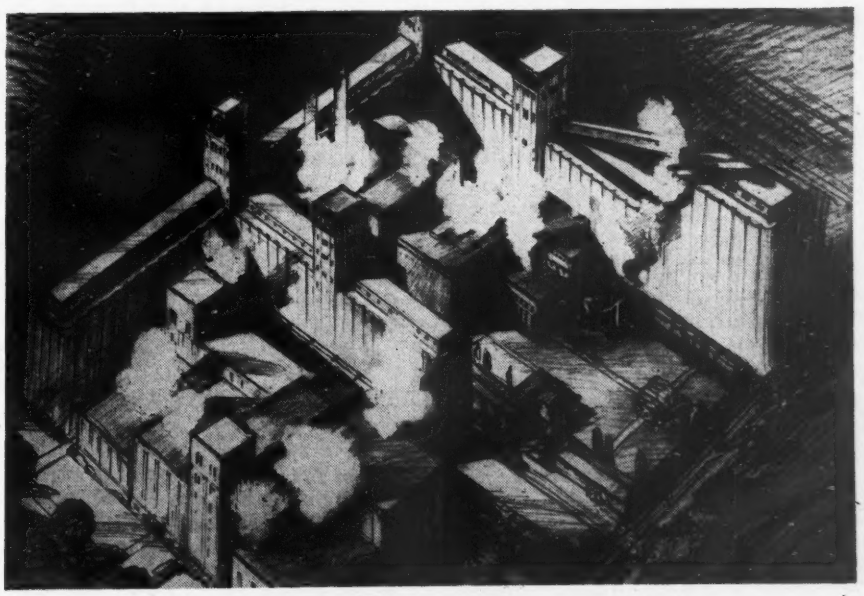
AMERICAN INSTITUTE OF BAKING directors recently approved a broad reorganization program based on an exhaustive study just completed by the well-known management engineering consultants, Booz, Allen and Hamilton, Chicago, after several months of research reaching into every section of the country. Louis E. Caster, American Institute of Baking chairman and president stated that the carrying out of the initial steps in the reorganization will be gradual and will not materially affect current operations or personnel. It will be carried out on the scientific, nutritional, research and educational levels.

M. Lee Marshall, AIB treasurer, has balanced the 1947 Institute budget through savings made in the transfer of AIB consumer service activities to the BIPP and in accepting a grant of approximately $25,000 made to the Institute by the American Bakers Association executive committee. Of the $20.00 per oven annual dues of the American Bakers Assn., $4.50 is to be set aside as interim financial aid to the Institute for this year. This special aid does not alter in any way the status of present sustaining memberships of bakers of allied firms. Under the new and expanded program allied firms are to gain much greater benefit through long range overall industry betterment.

### Vanilla Tops Chocolate Where It Counts Most

CHOCOLATE sodas are an 8 to 1 favorite at American soda fountains, according to the Ice Cream Merchandising Institute. Sundaes featuring chocolate lead the other flavors in that field, with pineapple, strawberry and cherry following in that order.

Of the 3,000,000,000 qt. of ice cream consumed last year, however, about half was vanilla, with chocolate accounting for about 15 percent, and 27 other flavors making up the remaining 35 percent, with strawberry in third place.



**CONSTRUCTION STARTS ON NEW MALTING PLANT**

**This architect's conception of the projected $4,000,000 malting plant of the Froedtert Grain & Milling Co., Inc., Milwaukee. Construction is well under way, the malt house being scheduled for early completion. The grain storage and cleaning unit will have a capacity of 4,000,000 bu. The plant will add one-third to the company's capacity, and will be the sixth plant under Froedtert operation.**

## Early Fiscal Reports Show Sales Increases

Two beverage companies, Hires and Canada Dry, recently reported heavy earnings for the nine months ending June 30. The Charles E. Hires Co. shows net sales of $6,572,177, as compared with $3,787,885 for the same period a year earlier. Profits, after taxes, increased 97 percent, coming to $545,776 as against $275,968 the previous year.

Canada Dry Ginger Ale, Inc., and its subsidiaries, report for the same period a net income of $1,552,003, compared with $1,365,187 in the same 1946 period. Net sales amounted to $30,926,858, up from $26,254,537 the year before. The common share dividend was 73 cents compared with 63 cents last year.

First quarter sales of H. J. Heinz Co., and its British, Canadian and Australian subsidiaries, totaled $36,718,979, an increase of 23 percent over the same period last year. This increase, according to H. J. Heinz 3d, company president, was almost entirely due to increases in volume rather than in prices.

## Research and Marketing Projects Move Ahead

PROGRESS in approving research projects under the Research and Marketing Act has been slow since the $9,000,000 appropriation became available at the end of July. But officials administering the program anticipate having a considerable number already approved or ready to go when the National Advisory Committee meets the first week in October.

At the beginning of September, the first 18 projects had been officially approved, and more were expected to be released every week throughout the month. The initial 18 announced included research on: Development of foreign outlets for U. S. agricultural products in plentiful supply and a study of foreign competition; processing in relation to preservation of quality and nutritive value of meats; hybridization for the genetic improvement in economic qualities of poultry; refrigeration of fruits and vegetables at the sources and at the markets. Only one specific project had actually gotten under way prior to the first announcements early in September. This was the development of portable corn-drying equipment to help farmers dry out this year's anticipated large production of "soft" corn.

An additional project was confirmed when E. A. Meyer, administrator of the program, told the American Soybean Association that the starting point for soybean research would be on the problem of improving flavor stability.

Officials in charge of the program have had to whittle down the vast number of suggested projects to those that could be financed with the $9,000,000 available. The broad general program as now projected by the R&MA staff will place particular emphasis on new extended uses of products, especially those such as citrus fruits, potatoes, and non-fat dry milk solids, for which future surpluses are anticipated. Funds will be used chiefly for additional laboratory and pilot plant investigations of new and improved processed products, and particularly for industrial uses for agricultural materials.

The program will place even greater emphasis on marketing research and services. Besides funds earmarked for this type of research, funds to be spent in cooperation with state experiment stations will also go for marketing research.

Substantial support is to be given to the improvement of marketing facilities, and methods and equipment for handling products more efficiently in such facilities.

## Meat Packers Stress Research at Meeting

NEED for a more extensive basic research program, more effective plant sanitation, continued plant modernization, forward-looking merchandising, and better understanding of the relationships between agronomy, genetics, and meat production keynoted the program of the 42nd annual meeting of the American Meat Institute.

Roy C. Newton, vice-president, Swift and Co., declared that research can be directed towards: 1. More economical production of raw materials. 2. Development of better manufacturing and processing methods. 3. Development of better products. 4. Furnishing more information on the usefulness of finished products to consumers. He emphasized the need for more basic research by the meat packers, saying the industry had not kept pace with developments.

Dr. H. R. Kraybill, director of the Institute's scientific research, reviewed some of the results of work done by the Institute on fat rancidity, causes of yellow fat in hogs, lard improvement, bacon curing, origin of green colorations in sausages and cooked meat loaves,

"DID YOU HISS?"

nutritive value of meat scraps, and tankage for poultry and animal feeding. He disclosed the development of antioxidant A.M.I. 72, which has thus far tested superior to all other antioxidants. Toxicity studies are still in progress.

Dr. Gerald N. Wendt, of Science Illustrated, and Dr. T. R. Hogness, University of Chicago, contributed to the research session by emphasizing the role of fundamental research in industrial progress and by urging industry support of basic research.

Dr. D. H. Nelson, chief chemist, Oscar Mayer & Co., Madison, Wis., pointed out the necessity for keeping possibilities of bacterial and other microorganism contamination of meat to a minimum. He cited nine aids to this end.

H. D. Tefft, director of Packinghouse Practice Department of the Institute, cited the need for cutting production costs through plant modernization, to reduce product handling, to obtain straight-line flow of production, to eliminate distance traveled between operations and processing steps and to mechanize all operations possible. Other objectives to be obtained through plant modernization are: 1. Provision for future expansion. 2. Elimination of product rehandling. 3. Consolidation of operations to obtain maximum use of floor space. 4. Improvement of working conditions through better lighting, better wash and locker room facilities and more adequate toilets and showers. 5. Higher level of plant sanitation and product quality. Included are provisions to obtain and maintain desired degrees of adequate refrigeration throughout the plant.

F. W. Specht, president, Armour and Co., summarized the long range problem of the meat packer to be high, not low prices. His explanation of the paradoxical statement was that through the years meat packing has been a surplus business and that except during unusual wartime and postwar periods certain kinds and cuts of meat had to be marketed at a loss with every product being in the surplus class at one time or another. His solution is to do better merchandising, obtain a higher demand for the low-priced, but equally nutritious products, and bring all cuts and products into a better balanced price range of average values. He encouraged study of potentialities of prepackaged fresh cuts, and of more informative and protective packaging.

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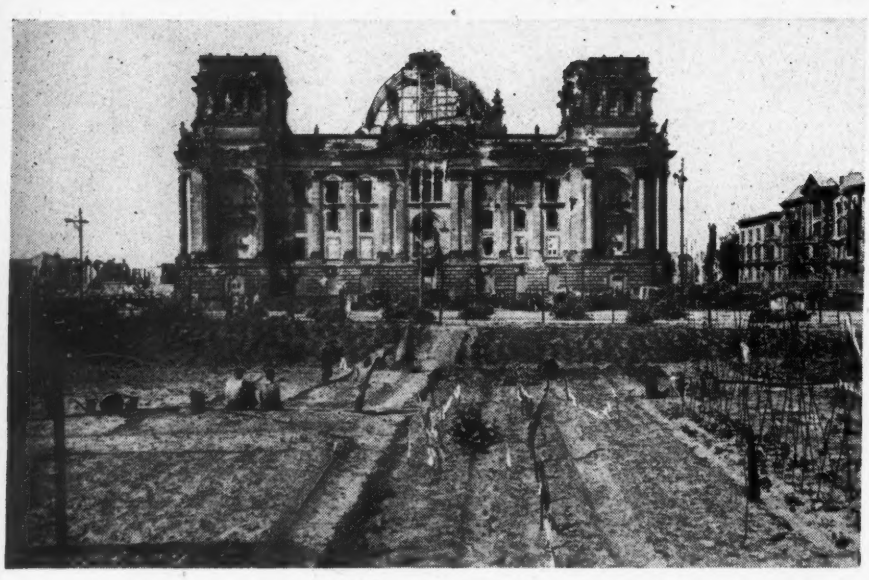


*Wide World*

GERMAN FOOD SUPPLY

**As the worst drought in 55 years threatens Germany's meager food supply, hungry Germans are more food conscious than ever. The upper picture shows a garden in front of the war damaged Reichstag, while in the lower, city dwellers are seen going over a freshly harvested wheat field hoping to find leftover grains.**

## DEVELOPMENTS IN DISTRIBUTION

### New Report Out On Cold Storage Stocks

MONTHLY reports on cold storage stocks of certain frozen fruits and vegetables by container size are now being published by the marketing facilities branch of the Production and Marketing Administration, USDA.

The report covers frozen peaches, raspberries, strawberries, asparagus, lima beans, snap beans, sweet corn, green peas, and spinach.

For the time being, the figures are published separately from the regular monthly Cold Storage Report. USDA statistical officials receive figures from the same group of warehouses that supply information for the regular Cold Storage report, but separate publication is intended for some time to permit more time to analyze returns and also to determine the usefulness of the new information.

The first report, as of August 1, covered 52 percent of the total stock of these commodities. Some of the figures reported were:

Frozen fruits—about one-fourth, 27 percent, of the total weight of the three frozen fruit items classified were reported in consumer size packages of 1 lb. or less. Peaches showed more than a third in consumer size packages, compared with three-tenths of the strawberries and about one-eighth of the raspberries.

Frozen vegetables—62 percent of the frozen vegetables reported were packaged in consumer sizes. Above this average were frozen asparagus, 78 percent; corn, 64 percent; and spinach, 73 percent. Below the average were green peas, 61 percent; snap beans, 39 percent; and lima beans, 48 percent.

A regional breakdown is also given in the tables of the report.

### California Refiners To Ship Bulk Sugar

CALIFORNIA and Hawaiian Sugar Refining Corp., Crockett, Calif., has begun construction of a $1,000,000 bulk raw sugar storage plant, to be in operation about August, 1948. Five cylindrical sheet-steel tanks, each 70 ft. high and 80 ft. in diameter, will have a total storage capacity of 50,000 tons of sugar. Hawaiian loaded raws will be dipped by crane from the holds of vessels, loaded into bucket elevators, conveyed to the tops of the tanks and dumped.

Earl B. Wilson, president of the sugar corporation, estimates that bulk handling of raw sugar will save about $1,000,000 a year, making feasible the huge investment necessary both on the mainland and in the Hawaiian Islands. The only bulk sugar loading port now in operation is Kahului on the island of Maui. A second, to cost $1,000,000, is under construction at Hilo, and others are planned for the islands of Kauai and Oahu.

Present daily output at the C and H Crockett refinery is almost 3,000 tons, but the new storage facilities are expected to greatly increase production.

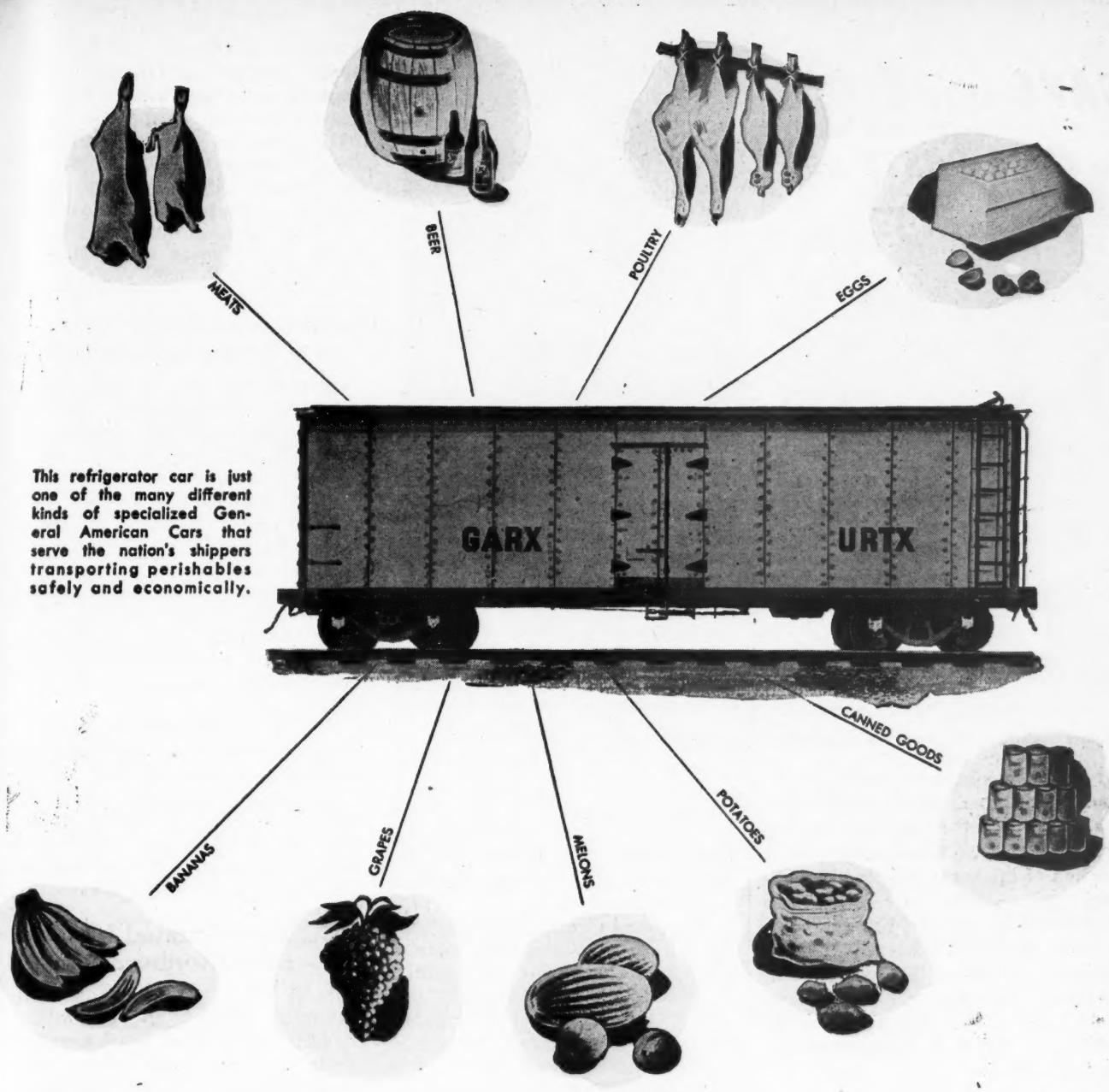
### Foods Show Gains in Exports and Imports

EXPORTS of foodstuffs from the United States during the first half of 1947 totaled $1,241,000,000, an increase of $30,000,000 over the corresponding period last year, the Office of International Trade, Department of Commerce, said today.

United States imports of foodstuffs during the first half of 1947, totaled $831,000,000 compared with $633,000,000 in the first half of 1946, an increase of $198,000,000 or 31.2 percent.

Foodstuffs recording the greatest export increase during the first half of 1947 compared with the same period in 1946, were grains and preparations rising from $412,000,000 to $674,000,000; fruits and preparations, from $74,000,000 to $95,000,000; fodders and feeds, from $3,000,000 to $17,000,000; and nuts and preparations, from $7,000,000 to $20,000,000.

Wheat flour exports for the first

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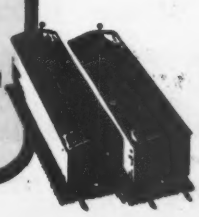

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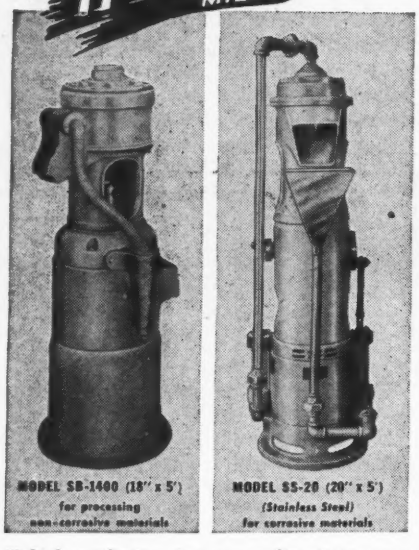


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**The National Kraut Packers Association selected this young lady as Miss Vitamin C, at their annual meeting in Sandusky, O., because "Vitamin C is the prize content of sauerkraut." So next time look before you pass up that second helping.**

half of 1947 totaled 47,085,000 hundred-pound sacks, amounting to $283,000,000, and representing a quantity increase of 84 percent as compared to 25,572,000 hundred-pound sacks, amounting to $98,000,000, shipped during the first six months of 1946.

Individual commodities outstanding in exports were corn, peanuts and grain sorghums, with quantity increases of 596 percent, 383 percent, and 18,150 percent respectively.

Other exported agricultural products showing major increases in the first half of 1947, were cornstarch and cornflour, up 377 percent in quantity and 358 percent in value; crude soybean oil, up 311 percent in quantity and 713 percent in value; burley leaf tobacco, up 12 percent in quantity and 54 percent in value; and inedible tallow, up 351 percent in quantity and 767 percent in value.

Decreases were recorded in exports of canned meats, which dropped 94 percent in quantity and 92 percent in value; evaporated milk, down 65 percent in quantity and 59 percent in value; wheat, down 39 percent in quantity and 27 percent in value; dehydrated soups, down 97 percent in quantity and 93 percent in value; and dried eggs, down 31 percent in quantity and 25 percent in value.

Major increases in imports of foodstuffs during the 1947 period compared with 1946 were recorded for cane sugar, unground black pepper, bananas, and prepared coconut meat. Cane sugar imports rose 52 percent in quantity and 105 percent in value; unground black pepper rose 3,212 percent in quantity and 6,400 percent in value; bananas up 20 percent in quantity and 30 percent in value; and prepared coconut meat rose 400 percent in quantity and value.

## Central American Sales Bright for Dried Milk

PROSPECTS for sale of dried milk from the U. S. are good in Costa Rica, Cuba, Dominican Republic, El Salvadore, Haiti, Honduras, Mexico, Nicaragua, and the Republic of Panama, according to a recent bulletin of the Department of Commerce. Markets in these countries are expanding, the department states, because the people are familiar with U. S. products, like them, and will continue to use them unless competitors enter the markets and undersell U. S. manufacturers.

Fresh milk supplies in most of these countries are inadequate, the bulletin continues, and will remain so for some time. The major limiting factor for greater sales for both dried whole and dried skim milk, is the low income level of the majority of the people.

## CCC Buys Canned Meet From Northern Mexico

THE U. S. DEPARTMENT OF AGRICULTURE, through the Commodity Credit Corporation, has contracted with the Juarez Meat Products Co., Juarez, Chihuahua, Mexico, for the purchase of 1,000,000 lb. of canned meat and gravy. The product is being resold by CCC to the International Refugee Association for the feeding of refugees in Europe.

Purchases of the canned meat and gravy, department officials point out, will provide a much-needed food for European refugees and also provide an outlet for cattle in northern Mexico. Cattle from this area were formerly exported to the United States. Under normal conditions imports of Mexican cattle to the U. S. amount to about 500,000 head annually.

Since the outbreak of foot-and-mouth disease in southern Mexico, the importation of cattle and other susceptible animals from Mexico to the United States has been prohibited. The disease now exists in several southern and central states of Mexico, but there have been no outbreaks in any of the northern states.

The battle to stamp out foot and mouth disease has already cost nearly $16,000,000 and the slaughter of over 300,000 head of livestock. Infected cattle were being killed at a rate of about 3,000 a day at the height of the campaign.

## Sweet Potato Support

THE U. S. DEPARTMENT OF AGRICULTURE has announced its program to support the price of the 1947 sweet potato crop from September 1, 1947, to April 30, 1948.

Major difference in the 1947 support program and the programs in effect the last three years is that commodity loans will not be used as a method of support nor will loans be available. If price support operations become necessary, support will be accomplished through purchases, or by diversion to other than normal channels, including industrial or livestock feed outlets. After November 15, the department may limit the rate of deliveries by time periods.

## Wine Consumption

APPARENT wine consumption during 1946, announced by the Wine Institute, San Francisco, averaged more than a gallon per person in 17 states and the District of Columbia. California led the nation with a per capita consumption of more than 2.5 gallons, while New York's 1.728 gallons was exceeded by Nevada's per capita consumption of 1.815 gallons.

**COMMUNITY CHESTS**

**The food industry has a wider than usual interest in this year's community chest drive, since its chairman is H. J. Heinz, II, president, H. J. Heinz Co. The Red Feather campaigns will be conducted in every community during October.**

*bad news for Bacteria...*

...but good news wherever food is handled—wherever dangerous bacteria might attack product quality.

Lo-Bax, the concentrated, fast-killing chlorine bactericide, helps prevent food spoilage and improves quality standards by rigidly controlling bacteria and sanitizing all surfaces with which foods and beverages come in contact.

Easy to handle—winter or summer—Lo-Bax kills bacteria almost instantly... at amazingly low cost. It contains 50% available chlorine, dissolves quickly in water—hot or cold, hard or soft—to make clear bactericidal rinse solutions. Learn how Lo-Bax can help you. Write us today.

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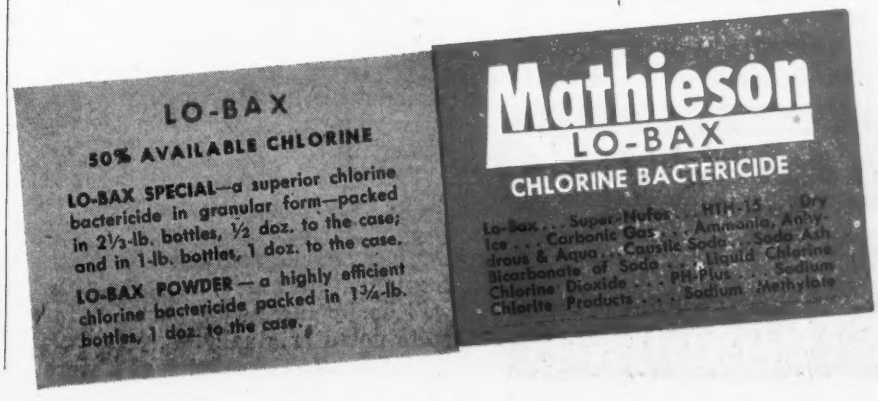
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50% AVAILABLE CHLORINE
LO-BAX SPECIAL—a superior chlorine bactericide in granular form—packed in 2⅓-lb. bottles, ½ doz. to the case; and in 1-lb. bottles, 1 doz. to the case.
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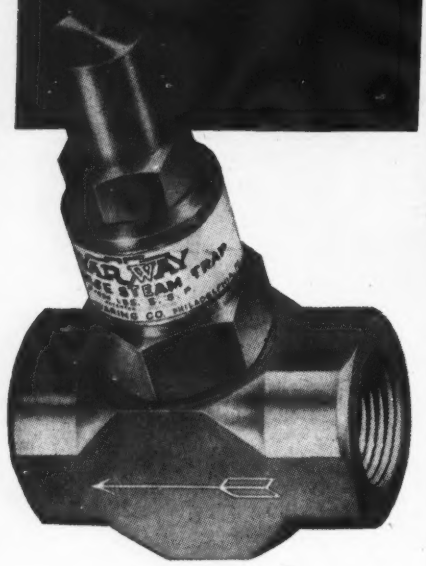
Good for
ALL
PRESSURES
without change
of Valve or Seat



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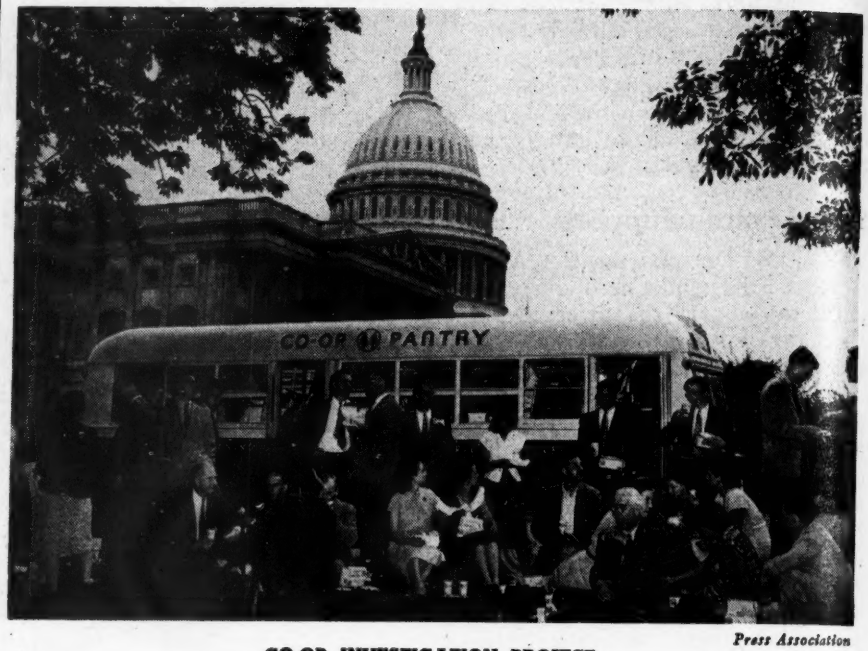
STEAM TRAP




*Press Association*

**CO-OP INVESTIGATION PROJECT**
**When the House small business committee started investigating the co-op at the Greenbelt, Md. housing project, those involved co-opped on a trip to Washington.**

## Reefer Demurrage Eased in ICC Order

EVIDENT easing in the supply of refrigerator cars has resulted in indefinite suspension of a three-year-old Interstate Commerce Commission service order which put penalty demurrage charges on cars held by shippers.

The ICC order, first issued in February, 1944, set up car demurrage penalties which cost shippers $11 for the fourth day of detention, $22 for the fifth day, and $44 a day after that. In May, 1946, the top figure was dropped to $11 for the fifth and each succeeding day of delay.

Regular tariff charges for demurrage were resumed in August. These tariffs provide for two free days, a charge of $2.20 per car for the third and fourth days, and $5.50 per day after that.

The ICC, however, still holds the penalty reins and can reinstate the order if the supply of cars tightens up again.

## Grain Exports

GRAIN export quotas, set by the Department of Agriculture, total 1,213,400 long tons, equivalent to 45,685,000 bu. This includes wheat, flour, barley and grain sorghums. No corn is included in the October program. The export quota for September was 1,196,900 tons.

## THE PROCESSING PICTURE

## Process Butter Rules Tightened This Month

REGULATIONS governing the manufacture and handling of process or renovated butter, first instituted in January of this year, have been tightened with the issuance of amendments to the original regulations by the Bureau of Dairy Industry, USDA.

Through correction of language in the regulations, condemnation is now authorized where process butter has become contaminated with the immature stages of insects, as well as by insects or parts of insects noted originally.

Three additional changes were made. One permits the storage of butter oil in commercial warehouses, relaxing the original rules, which permitted storage of the oil only in process butter plants. The second change permits the process butter plants to use kerosene to denature contaminated material. Previously, it had not been permitted because it was thought kerosene would not be acceptable in contaminated butter sold for industrial uses.

The third change requires the use of non-corrosive metal in all equipment used in process butter production, whereas the previous rules had required it only in certain kinds of equipment.

## Plan Cold-Dye Process For Citrus Coloring

SEVERAL packing houses are expected to use, on a commercial scale next winter, a new cold-dye process for coloring oranges. Dr. James Otis Handy, associated with the Fruit Treating Corp., Orlando, Fla., as research chemist, said that such a dye has been sought for a long time to improve the keeping qualities of fruit to which color is added to improve appearance.

Dr. Handy pointed out that the process in general use by packing plants today requires a temperature of around 120 deg., remaining constant for a period of four minutes. The new process of dyeing at room temperature, will spare the fruit from high-temperature injury and produce a better, healthier color.

Under the Handy system oranges would be covered with dye for a longer period. However, a shorter time in the ethylene gas room, at a temperature of 85 deg., would result in savings of up to 12 hours in the time from grove to shipping, Dr. Handy declared.

## Gov't Agencies Act Upon Food Standards

CANNED shrimp standards of fill of container were tentatively ordered not to be amended to provide for reduction in the requirement of cut-out weight. This Food and Drug Administration order, page 5429 of the August 9 Federal Register, was based on the findings of fact in the hearing held on July 8. Objection to this tentative order was filed by the National Shrimp Canners Association. The Federal Security administrator's final order, expected in September, completes official action on this docket.

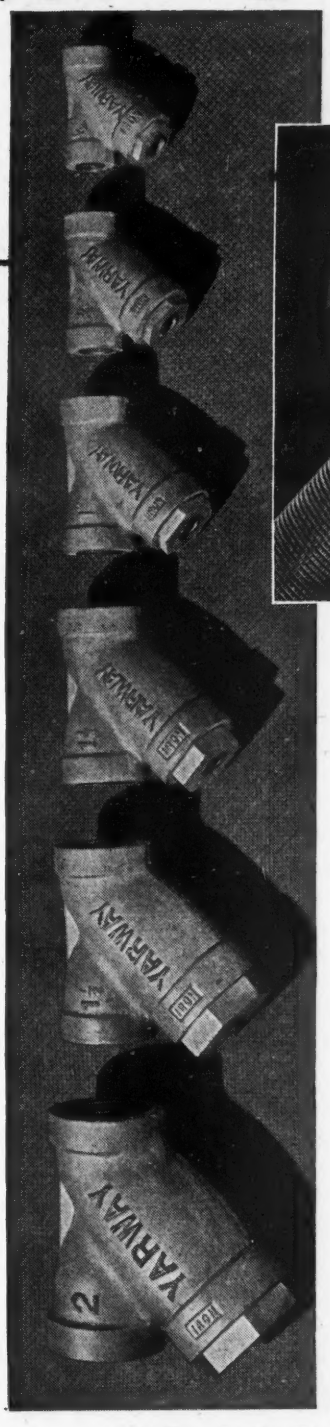
Canned oyster standards of identity and fill of container were considered at a hearing on July 10. The proposed order covering suggested amendments had not been issued up to the first of September.

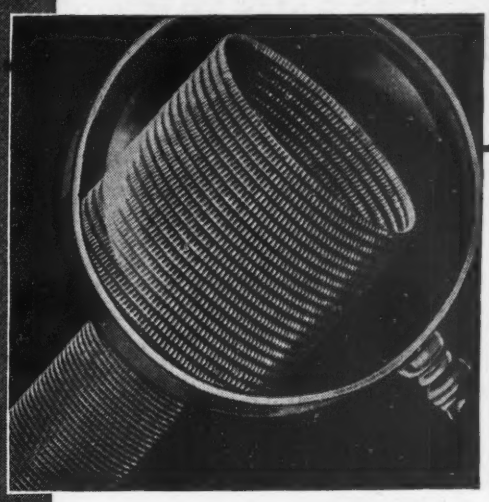
Rum seasoning of canned fruits would be permitted only if the foods were identified as "canned (fruit) with rum." Addition of sufficient rum to give a suitable rum flavor to the canned fruits so changes their character "that consumers generally would consider them foods distinctly different from canned peaches, canned apricots, canned pears, canned cherries, and canned fruit cocktail, even if the labels of each such food carried the explanatory designation 'Seasoned with Rum.'" Accordingly, new standards of identity are proposed for


PREVENT

*Rust·Scale·Dirt*

FROM CLOGGING STEAM EQUIPMENT





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- *Body Cadmium Plated for Protection Against Corrosion and for better appearance.*
- *Readily Removed Steel Blow-Off Bushing.*
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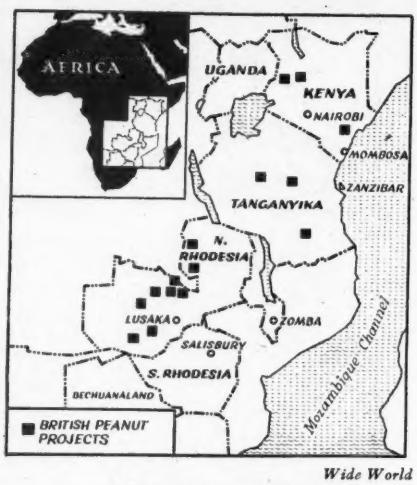


*Wide World*

**AFRICAN PEANUTS**

**The black squares show the locations of British peanut projects in Africa, a part of a program to boost world production of food. Model farm units and villages are to be established on 3,210,000 acres of uninhabited, waterless and fly-infested land. It is estimated the land will produce about 800,000 tons of vegetable oilseed a year, about one-third of the British supply.**

canned peaches with rum, canned apricots with rum, canned pears with rum, and canned cherries with rum. Only difference between present standards of identity for these canned fruits that do not contain rum is that the new product "contains added rum in such amount that its alcoholic content is more than 3 percent but less than 5 percent by weight."

Canned fruit cocktail to which rum has been added in the stated proportions does not have "the blended fruit flavor characteristic which is expected by consumers of this food." It was concluded, therefore, "that it would not promote honesty and fair dealing in the interest of consumers to adopt a definition and standard of identity for fruit cocktail with rum added." This proposed order, covering both canned fruits and canned fruit cocktail, appeared on page 5574 of the August 19 Federal Register.

### Fruit Jelly Grades

Fruit jellies will be covered by new U. S. Grade Standards, issued in proposed form by Production and Marketing Administration of U. S. Department of Agriculture. September 12 was set as the deadline for persons desiring to submit written data, views, or arguments in connection with the proposed standards which were published on page 5488 of the August 13 Federal Register.

Three grades of fruit jelly were proposed, and a recommended fill of container of not less than 90 percent of the capacity of the container is included. The jellies may be prepared from a single variety of fruit or from a mixture of two or more varieties. Compliance with Food and Drug standards of identity is basic in the grade standards.

Consistency, color, and flavor are the three factors on which the fruit jelly grade is based. Consistency and flavor are scored on a scale of 40 points each and color 20 points. Tolerance for certification of officially drawn samples and a sample scoresheet for fruit jelly concludes the proposed grade standards.

### Canned Beans

Canned green beans and canned wax beans are now covered by the third issue of U. S. Grade Standards. Effective on September 26, the revised standards were published on page 5743 of the August 27 Federal Register. Previous discussion of these standards appeared on page 127 of the August issue of FOOD INDUSTRIES.

### Walnuts

Consumers of walnuts will soon see new pack specifications and minimum requirements for merchantable unshelled walnuts grown in the Pacific Coast States. The new rules were issued in the September 5th Federal Register on page 5907. Factors included standard and special sizes for varietal and seedling or mixed packs. External appearance and condition are considered and quality grade specifications are outlined in some detail.

## Grade Standards Set For Two Fruits

DATES have been covered by U. S. grade standards for the first time. Published in the Federal Register for July 12, on pages 4623 to 4626, the standards were to become effective August 11. "They are designed to serve as a convenient basis for sale in wholesale transactions and as a basis for determining loan values on hypothecated stocks. They will also serve as a basis for the inspection of this commodity by the federal inspection service . . ." Those handling dried fruits are invited to study the standards and to make suggestions for improving them.

Citrus fruits U. S. Grade No. 2 and U. S. Combination Grade would be somewhat improved by the adoption of proposed amended standards for these grades. Detailed specifications for shape and color have been raised slightly in the proposed

order published in the Federal Register for July 3 on page 4351. No objections were filed up to the deadline provided, so a formal order promulgating this proposed change will probably be the next official action.

## "AA" Standard for Oranges by October

A NEW top grade of quality for common sweet oranges—"AA"—was expected to be created about October 1, by the Production and Marketing Administration, Department of Agriculture.

The proposed amendment setting up the new double A quality, as proposed through publication of the Federal Register last month, calls for a higher ratio of solids to acids in the juice of the orange. The fruit in each standard-packed box of the proposed AA grade must contain not less than 5 gal. of juice, which must test not less than 10 percent solids and must have a percentage of citric acid falling within certain specified limits.

The new AA standard was proposed and approved by the Florida Citrus Commission—and USDA officials took steps to assure that the new standard becomes effective with the new packing season.

## Foreign Scientists With Quartermaster

C. W. BRABENDER, internationally known designer of testing equipment used by food processors and A. W. Fornet, European expert on grain, flour and breadmaking, are the first foreign scientists to be assigned to the Quartermaster Food and Container Institute, Chicago. Mr. Brabender is designing equipment to provide a new method for determining the staling of bread and a new type of dehumidifier to simulate varying climatic conditions in a test chamber. Dr. Fornet is the author of "From Flour to Bread," a technical and practical text on flour and bread production and was consultant to the Royal Baking Powder Co. in Berlin.

## New Assistant

DR. GEORGE W. IRVING, JR., became an assistant chief of USDA's Bureau of Agricultural and Industrial Chemistry, September 7, Dr. Louis B. Howard, chief of the bureau, has announced.

In his new position Dr. Irving, along with two other assistant chiefs, will participate with the chief in the planning and adminis-


*it's here...*

**NEW Multi-Purpose Detergent**

**that's**
- **EASY ON THE HANDS**
- **ECONOMICAL**
- **EXTREMELY EFFICIENT**

# OAKITE COMPOSITION No. 83

Actually, you designed Oakite Composition No. 83, the new multi-purpose detergent. You told us you wanted a material that could be counted upon to do a good job of cleaning. You wanted a material that wouldn't cost too much. And you wanted a material that would go easy on the hands. Well, here's the material you asked for . . . it's

## OAKITE COMPOSITION No. 83

*And here's what you can expect from it:*

**HIGH CLEANING EFFICIENCY**—Oakite Composition No. 83 contains surface-active agents that penetrate and emulsify fats and the like . . . even in extremely hard water areas. So that those contaminants thoroughly rinse away leaving equipment film-free . . . sanitary.

**EASY ON THE HANDS**—Oakite Composition No. 83 will prove particularly helpful on those manual cleaning jobs requiring immersion of the hands over long periods. Female operators, especially, will appreciate the kind-to-hands quality found in Oakite Composition No. 83.

**ECONOMICAL**—Oakite Composition No. 83 is a concentrated cleaning compound. A little mixed with water goes a long way. Yet, an economical solution of Oakite Composition No. 83 does a thorough cleaning job . . . does a safe cleaning job. Lends speed to sanitary procedures throughout the plant.

You can give Oakite Composition No. 83 a try-out in your plant merely by calling your nearby Oakite Technical Service Representative. Or write us direct. We'll be glad to send you free descriptive literature.

*Use Oakite Composition No. 83 to speed up these cleaning jobs*

**Sorting Tables**
**Ham Molds**
**Sausage Sticks**
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*. . . in Standard Sizes or designed to Specific Job Needs*

ALL LEE KETTLES ARE MADE TO A.S.M.E. CODE AND CERTIFICATE FURNISHED WITH EACH JOB

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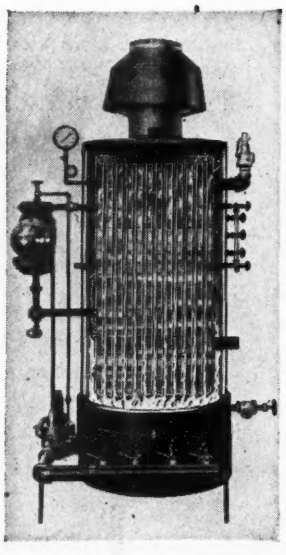
*Engineered Steam*—a steam source . . . compact, self-contained, and "tailor-made" for *your* job . . . that includes: the study and solution of your problem; the correctly sized and constructed KANE Automatic Gas-Fired Boiler; the necessary controls to maintain proper steam pressure and temperature; the M-K-O Automatic Boiler Feed to provide a constant water level for highest boiler efficiency; and the Engineering (of more than four decades) to assure you of an economical installation.



The KANE Boiler, in sizes 1 to 30 H.P., built to A.S.M.E. specifications.

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FOUR DECADES OF AUTOMATIC GAS-FIRED BOILER MANUFACTURING EXPERIENCE.

tration of the bureau's research and development activities, which include the four Regional Research Laboratories, authorized in 1938 to search for new and wider industrial outlets and markets for agricultural commodities.

## Bakers' Short Courses Offered by Institute

A SERIES of short courses on special baking products and problems will be offered by the American Institute School of Baking, Chicago, during the first six months of 1948. The courses, arranged for an enrollment of 60 each, have been designed to accelerate the Institute's program in accommodating the list of applicants seeking admission.

The first of the courses, opening January 5th, 1948, will be devoted to the study and production of pie; the second course, opening January 19th, will be on cake; the third course, starting February 9th will be on bakery sanitation; and the last in the first series beginning February 16th will be on retail baking.

## Concentrated Tomatoes Show Vitamin C Loss

AN investigation of the vitamin C content of canned and stored tomatoes and tomato products was recently reported by Miriam E. Hummel, University of California, Berkeley. The studies were made under the direction of Ruth Okey, professor of home economics and biochemist in the experiment station.

The experiments indicated greater losses of vitamin C in the concentrated products than in the unconcentrated solid pack or juice. Unconcentrated tomato products lost only 10 percent of their vitamin C content when stored at room temperature for 6 months to one year. On the other hand, five commercial pastes lost an average of 30 percent after six months storage. In both cases, the vitamin loss was higher when stored at 90 to 98 deg. F.

Still to be determined is the feasibility of concentrating, transporting, diluting, and then storing.

## Lard Export

A SPECIAL allocation of 15,000,000 lb. of lard for commercial export has been made by USDA. The allocation, in line with recommendations of the International Emergency Food Council, is intended to meet urgent needs in the countries to which it will be sent.

## RAW MATERIALS

### Propose Regulations For Insecticide Use

REGULATIONS under the new federal Insecticide, Fungicide, and Rodenticide Act, approved June 25, were the subject of a hearing, August 25. The proposed regulations were printed in the Federal Register on August 6, pages 5343 to 5346. All persons interested were given the choice of attending the hearing or filing written data, views, and arguments. September 8 was set as the deadline for such written material.

Promulgation of the regulations by the Secretary of Agriculture will be at the earliest possible date after September 8. The effective date will be 30 days after promulgation, in accordance with the Administrative Procedures Act.

The biggest part of the new work expected by Federal officials will be the registration of materials used for pest control. December 25, "six months after enactment," is the date set by Congress for registration of herbicides and rodenticides, which have not previously been controlled by the superseded Insecticide Act of 1910. Registration of insecticides and fungicides may be completed at any time prior to June 25, 1948, one year from the date of enactment.

Certain arsenic and fluorine containing compounds, which are specified in the regulations, must be colored to avoid possible confusion with food products when in the hands of the ultimate consumer. Other insecticides, not now specifically designated to be colored, may

*Associated Press*

**MICHIGAN PEACHES**

**The Michigan peach industry came up with a different pose for its "Romeo Peach Queen." That's an entrance to the White House in the background. You will have to guess who the peaches are for.**


NATIONAL AIROIL FUEL OIL - GAS BURNERS

"AIROCOOL" GAS BURNER NOZZLES

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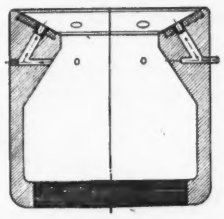

PREVENT OVERHEATING AND BURNING OF CASTINGS . . .

Recessed facing of refractory insulating plastic protects nozzle from extreme heat and prolongs nozzle life.

For detailed information about these long-life nozzles, write for Supplement 3 to Bulletin 55.

and insure stable ignition over a long, trouble-free life. Renewable type recessed gas tips direct the separate igniter flames against the main volume of the mixture to insure stable ignition . . . and allow greater turndown without burnback.

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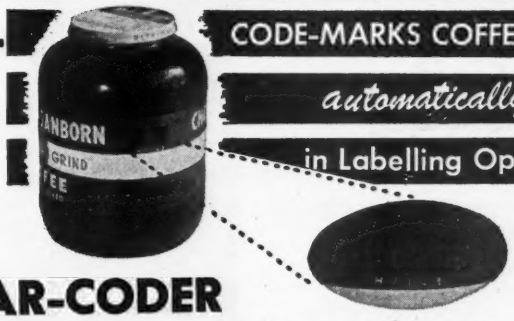
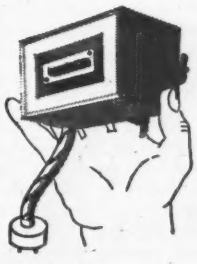
HERE'S HOW Chase and Sanborn CODE-MARKS COFFEE JARS *automatically* in Labelling Operation




JAR-CODER makes clear, yet inconspicuous, mark

Quality control at Chase and Sanborn includes coding every jar of this delicious coffee . . . while efficiency rules out an *extra* production operation for marking. To meet this need Gottscho engineers developed JAR-CODER to mark Chase and Sanborn Coffee jars automatically as part of the labelling operation. Result is a readily identifiable—yet *inconspicuous*—mark in the same location on each jar.



JAR-CODER is now available to other manufacturers who wish to code-mark wrap-around labels of jars, cans, etc. Write today for details and name of local distributor.

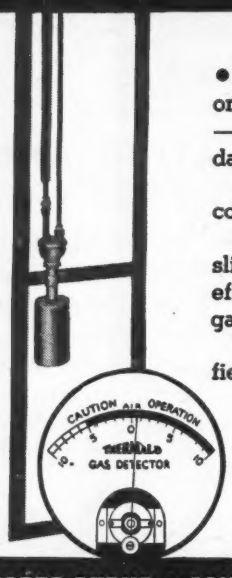
MARK-O-MATIC

ADOLPH GOTTSCHO, INC. MARKING EQUIPMENT

191 DUANE ST., NEW YORK 13, N. Y.

★ SEE OUR CATALOG IN 1948 SWEET'S FILE FOR PROCESS INDUSTRIES ★

BURNS THERMALO
GAS DETECTOR
Guards Your GAS-FIRED PROCESSING EQUIPMENT . . . . . day and night!




• This new instrument detects unburned gas, from leaks or incomplete combustion—indicates the concentration —and operates an automatic gas shut-off well before the danger point is reached.

It operates during idle periods as well as through the combustion cycle . . . 24 hours a day.

So sensitive is the detector that its dial indicates even slight deviations from the correct fuel mixture. Equally effective for mixtures of flammable gases with inert gases—and for air-gas atmospheres.

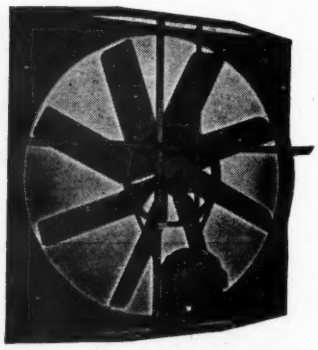
The Thermalo Gas Detector is furnished for any specified type of gas fuel: manufactured, natural or bottled gas.

★ ELECTRICAL
★ NO GLOWING FILAMENTS
★ CONTINUOUS GAS SAMPLING

*Write us your problem*

JABEZ BURNS & SONS, INC., 11th Ave. at 43rd St., New York 18, N. Y.
*Industrial Engineers Since 1864*

Remove Stale Air and Fumes
WITH
Coolair
TRADE MARK
EXHAUST FANS



Peak production records are never made by employees who are not feeling up to par . . . whose energy is being undermined by over-heated, stale air or dangerous fumes. Give *your* workers plenty of fresh air if you expect them to have that up-and-at-'em feeling. And be sure the air is moving fast enough to create a cooling breeze. In short, give them Coolair BREEZE CONDITIONING.

Coolair Exhaust Fans are scientifically engineered for efficiency and long life. They are sold only by Authorized Coolair Dealers who are trained under factory supervision in making accurate layouts and installations. For scientific ventilation, call your Authorized Coolair Dealer. There is no obligation for a survey.

ENGINEERS AND ARCHITECTS
For descriptive and technical data see:
SWEET'S CATALOG FILE Architectural
SWEET'S CATALOG FILE for Builders
A.S.H.V.E. GUIDE
ELECTRICAL BUYER'S REFERENCE

AMERICAN COOLAIR CORPORATION
*"Pioneer Manufacturers of V-Belt Drive Exhaust Fans"*
3604 Mayflower Street Jacksonville 3, Florida

be added subsequently following formal hearings.

Some of the requirements for registration and labeling of these materials, as outlined in the proposed regulations, have caused some concern to chemicals manufacturers who ship their products to insecticide formulators and distributors. One interpretation of the law is that a chemical which is to be the active ingredient of an insecticide must be registered and labeled just as if it were a finished insecticide going to the final consumer, even though it is being shipped only for further handling by another industrial concern.

## New Bean Promised To Be Canned Uncut

A NEW variety of tiny green beans, stringless and small enough to be canned without cutting, looms as a prospect for the metal package, says the Can Manufacturers Institute. These newly-developed midget pods were evolved by Dr. A. F. Yeager, head of the horticulture department of the University of New Hampshire, in response to an appeal from the canning industry.

Experiments were carried on with the object of originating a fairly matured pod with white seeds that could be canned uncut. Beans with white seeds are preferable to those with colored seeds because they produce a clearer juice in the can. Both of these objectives were attained in the final specimen bean.

The new variety has a marked excellence of quality despite the smallness of the pod. Tests run on the seeds, when used as dry beans for cooking, were also found to be uniformly good.

## Tomato Diseases Get Special Attention

A MEETING to discuss 1947 experiences on the control of tomato diseases to which tomato canners, technical fieldmen, plant pathologists and horticulturists from all tomato canning states are invited, is being sponsored by the National Canners Association and the Pennsylvania Canners Association, November 18. The conference will be held either at York or Harrisburg, Pa., depending upon available hotel facilities.

In the meantime, the New York State Agricultural Experiment Station, Geneva, has issued a publication on Control of Tomato Diseases by Spraying. The bulletin, No. 724, tells the results of tests made against early blight, late

# 2518

**plants in the food processing industries have benefited by using Stephens-Adamson bulk material handling equipment**

Why have so many food plants chosen S-A equipment? Because in S-A equipment they find the ideal combination of the right handling units, engineered into the right system for each particular job. This is the combination that assures moving the right volume to the right place at low cost over the long term. ¶ In calling on S-A engineers, you get the benefit of this company's more than 46 years of specialization in solving bulk material handling problems. And because S-A produces a complete line of conveyors and accessories, their choice of equipment is unrestricted. You get exactly what you need for full handling efficiency.

STEPHENS-ADAMSON MFG. CO.

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*Designers and Manufacturers of All Types of*

BULK MATERIAL HANDLING EQUIPMENT

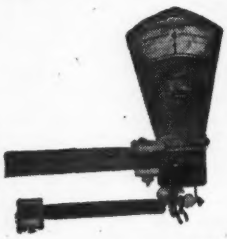
# DETECTO SCALES

There's a precision-accurate Detecto Scale for your specific weighing and counting need. The Detecto helps increase production, yet assures you maximum accuracy by making slightest weight discrepancies immediately visible.

**No. 1800 DETECTO-GRAM INDICATOR HEAD**

One more Detecto weighing instrument to speed production. This attachment converts your present beam scales to accurate weighing equipment. Indicator stops instantly at correct weight.

*Write for circular.*



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SCALE ENGINEERS IN ALL PRINCIPAL CITIES



# VIKING

*The* MARK OF A GOOD RELIABLE ROTARY PUMP

VIKING PUMPS
"GEAR WITHIN A GEAR"
JUST 2 MOVING PARTS
REG. T.M. IN U.S.A.
VIKING PUMP CO.
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Look for this registered trade mark and name VIKING on all your rotary pumps. It is your assurance of a good, reliable pump for handling all liquid and semi-solid food products.

It means you have a pump based on the design of more than a million others. Built from sound rotary pump experience and know-how unsurpassed in the field.

Look to Viking, the rotary pump manufacturer who builds to serve you now and in the future. Be safe. Be sure. Buy Viking. Write today for free bulletin 100E.

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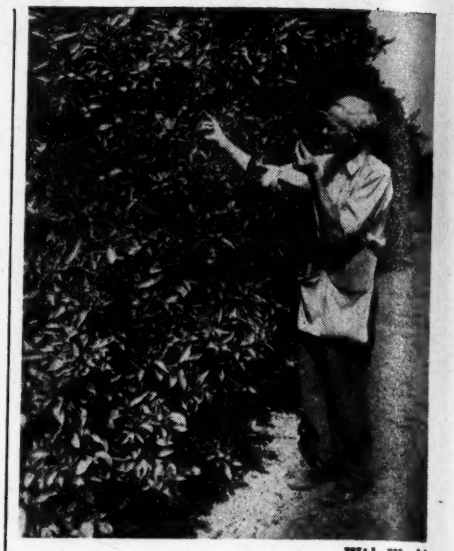


*Wide World*

**CITRUS BEETLES**

**Capsules containing ten ladybird beetles are shown being emptied into a citrus tree, in Rivera, Calif., to start a colony that will eliminate mealybug infestation. The beetles are raised artificially at the Los Angeles Co. Insectary from original Australian stock.**

blight, anthracnose and leaf mold. Single copies can be obtained at the Station.

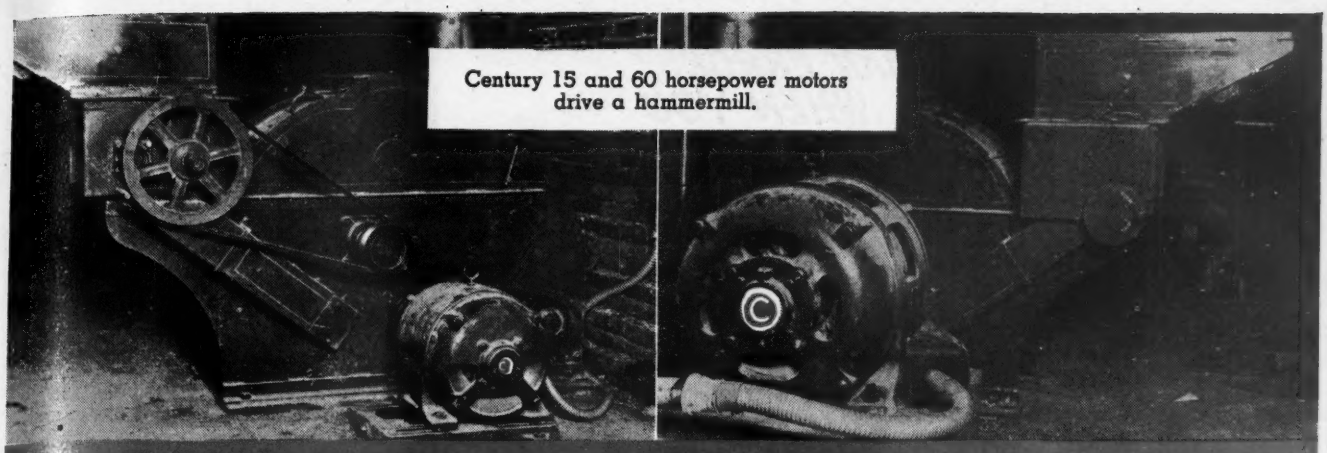
McGRAW-HILL *World News*

## British Plan to Up Aussie Food Output

MELBOURNE — Western Australia and Queensland are earnest bidders for a slice of the $200,000,000 which Overseas Food Corp. will invest to develop food production in the dominions and colonies. OFC will be established in October by the British government.

English negotiators will shortly sound Australian officials on possibilities of stimulating production of foodstuffs that England must now import from Latin America and the Orient. Australia is particularly interested in meeting English demands for meat, peanut oil and oil cakes.

Australia's share of OFC's investments will be spent on irrigation, farm mechanization, improved soil management and food processing plant. Shortage of farm hands in Australia makes it necessary to tackle the projected food boost from a mechanical angle, but if shipping becomes available English immigrant farm labor may be also provided.



Century 15 and 60 horsepower motors drive a hammermill.

## Keep Food Processing and Handling Machinery at

# Peak Production with CENTURY Motor Power

There's a wide range of standard Century motors specifically suited to food processing applications such as mixers, pumps, conveyors, compressors, blowers, pulverizers, washers, pasteurizers, etc. These motors may be protected with splash proof, totally enclosed fan cooled or explosion proof frames to guard against any unusual hazards of surrounding atmospheres. A wide range of torques are available to match the widely different load characteristics of equipment used in the food industry.

Century motors are built to stand up under the toughest operating conditions. Their rugged frames, accurately machined feet, large shafts, accurate alignment and good mechanical and electrical balance—all contribute to their outstanding performance.

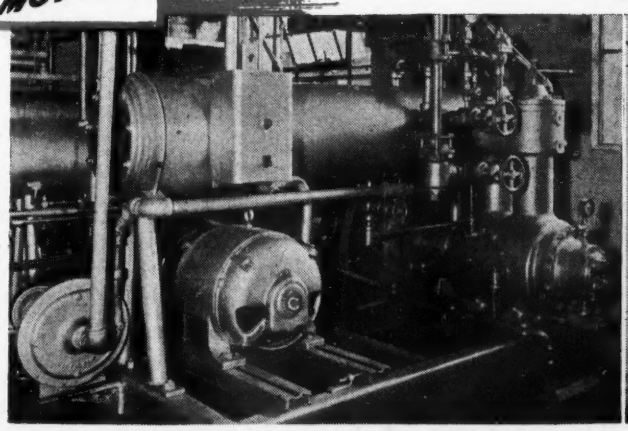
Century builds a complete line of fractional and integral horsepower electric motors in the popular sizes to meet the requirements of industrial production, commercial and appliance needs.

Specify Century motors for all your electric power requirements.

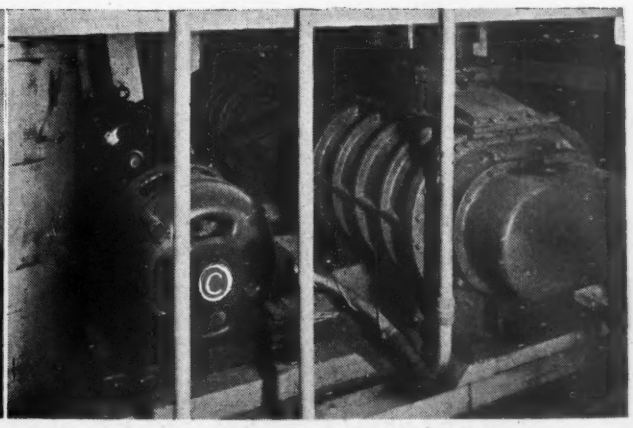
Century C MOTORS

**CENTURY ELECTRIC COMPANY** • 1806 Pine St., St. Louis 3, Mo.

*Offices and Stock Points in Principal Cities*



Century 15 horsepower motor driving a refrigeration compressor.

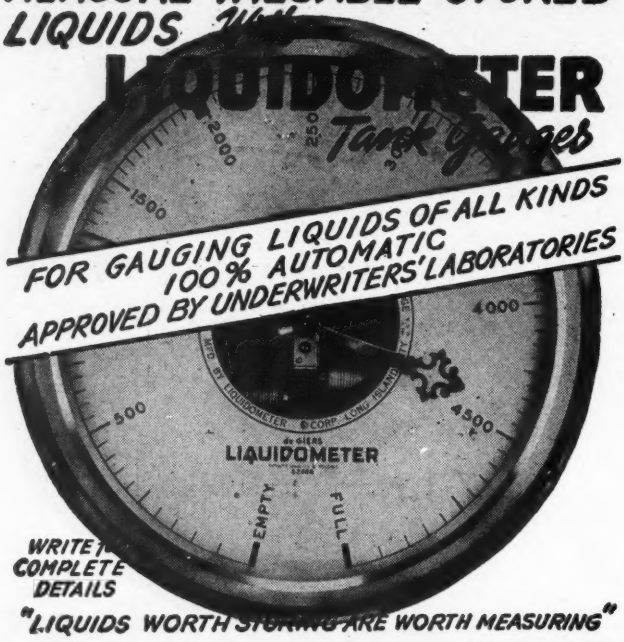


Century 30 horsepower motors driving blowers on rice underloaders.

554

COSTLY HUMAN ERRORS ELIMINATED WHEN YOU MEASURE VALUABLE STORED LIQUIDS With

LIQUIDOMETER Tank Gauges




FOR GAUGING LIQUIDS OF ALL KINDS
100% AUTOMATIC
APPROVED BY UNDERWRITERS' LABORATORIES

WRITE FOR COMPLETE DETAILS

"LIQUIDS WORTH STORING ARE WORTH MEASURING"

THE LIQUIDOMETER CORP.
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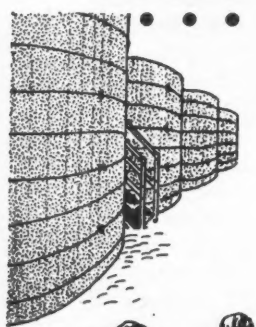

FOOD PROCESSING EQUIPMENT *A Problem?*

Tidewater
RED CYPRESS

IS YOUR ANSWER!

**A PROVEN FACT:** Tidewater Red Cypress does not impart odor, taste, or discoloration to food with which it is brought into contact. This fact alone makes it ideal for such items as fermenting vats, processing tables, churns, pickle containers, etc.

**A PLUS VALUE:** This outstanding wood also offers extraordinary resistance to deterioration when used under adverse conditions such as extreme dampness, heat, etc.

SCMA

The Master Red Cypress
"The Wood Eternal"

LET US HELP YOU. WE INVITE INQUIRIES CONCERNING ALL TYPES OF TANKS AND VATS — FULLY FABRICATED OR PARTIALLY FABRICATED

FLEISHEL LUMBER COMPANY
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The knottiest snag in the plan is England's inability to provide farm machinery. Dollar and shipping shortages have stymied imports of American tractors and harvesting equipment.

## Destroy Sugar Data

AMSTERDAM—The archives and library of the experimental station for sugar at Pasaroean, East Java, have been totally estroyed by order of Indonesian Republican authorities, it was learned from the Netherlands Indies Department of Economic Affairs. The loss of unparalleled documents of this institution, world famous for its agricultural, technical and chemical research, means an immeasurable and irreplaceable loss to the science of sugar cane cultivation and processing in general and to the industry in Java in particular.

## SCHEDULE OF EVENTS

### October

6- 7—Packaging Machinery Manufacturers Institute, 15th annual meeting, Hotel Sheraton, Springfield, Mass.
12-17—National Association The Master Brewers Association of America, 60th anniversary convention and brewing industries exposition, Public Auditorium, Cleveland.
20-21—Boston Conference on Distribution, 19th annual meeting, Hotel Statler, Boston, Mass.
20-22—American Oil Chemists' Society, annual fall meeting, Edgewater Beach Hotel, Chicago.
20-22—Bakers Supply House Association, annual convention, Edgewater Gulf Hotel, Edgewater Park, Miss.
21-25—Pacific Chemical Exposition, biennial meeting, Civic Auditorium, San Francisco, Calif.
23-24—National Pickle Packers Association, fall meeting, Hotel Continental, Chicago.
27-29—International Association of Ice Cream Manufacturers, annual convention, St. Moritz Hotel, Miami Beach, Fla.
30-31—National Research Corp., high vacuum symposium, Cambridge, Mass.
30-Nov. 1—Milk Industry Foundation, St. Moritz Hotel, Miami Beach, Fla.
30-Nov. 1—American Bakers Association, goiden anniversary convention, Stevens Hotel, Chicago.

### November

2- 6—Super Market Institute, 10th annual convention, Hotel Sherman, Chicago.
3- 4—Millers National Federation, fall meeting, Hotel Jefferson, St. Louis, Mo.
10-12—Grocery Manufacturers of America, 39th annual meeting, Waldorf-Astoria, New York.
17-21—American Bottlers of Carbonated Beverages, 29th annual meeting and international beverage exposition, Convention Hall, Atlantic City, N. J.
18-19—Packaging Institute, 9th annual forum, Hotel Commodore, New York.
19-20—American Butter Institute, 39th annual convention, Congress Hotel, Chicago.

### December

1- 6—21st Chemical Industries Exposition, Grand Central Palace, New York.
3- 5—Tri-State Packers Association, fall convention, Hotel Traymore, Atlantic City, N. J.

# Changes in Food Supplies

## (Indicators)

### Production

**A reduction** of from 10 to 20 percent in the 1947 pack of canned vegetables, compared with last year's record output, is forecast by the Bureau of Agricultural Economics. Gains will be shown in this year's pack of pimientos and possibly in the packs of asparagus and green lima beans. All other vegetable packs, BAE indicates, will be smaller than last year.

**Creamery** butter production, estimated at 148,855,000 lb., in July, was down 5 percent from June and up only 15 percent from a year ago. The June output was 30 percent larger than that of June, 1946.

**American cheese** achieved another July production record when 113,385,000 lb. was estimated. This is 13 percent more than the previous July record established in 1945. The June-July seasonal decline, however, was 10 percent, compared with 9 percent last year.

**Ice Cream** output, in July, was up 10 percent from June, but was 19 percent below July, 1946. Estimated at 73,575,000 gal., production was only 27 percent above the 1941-45 average.

**Mayonnaise** and salad dressing production, in 1946, totaled 57,900,000 gal., second only to 1944, when output reached 58,700,000.

**Alaska salmon** pack, as of August 9, was far ahead of last year's pack. On that date 3,246,508 cases had been put up compared with 2,375,751 cases on Aug. 10, 1946.

**Lard** production, in July, came to 139,113,000 lb., compared with June output of 151,486,000 lb.

### Raw Materials

**Tomatoes** for processing are estimated at 3,227,700 tons in the 1947 forecasts. This is 5 percent under the record 1946 production, but is about 32 percent above the 1936-45 average.

**Snap beans** for processing are now expected to reach 197,300 tons, this year, 5,000 tons more than was indicated, July 1. This would be a 6 percent drop from 1946, but nearly 23 percent above the ten-year average of 160,700 tons.

**Sweet corn** for processing is now indicated at 1,209,700 tons, 2 percent less than last year's actual crop, but about 26 percent above the 1936-45 average.

**Cranberry** production, for 1947, is forecast at 770,900 barrels, down from last year's high output of 857,100 barrels, but well above the 1936-45 average of 638,830 barrels.

### Stocks and Storage

**Canned lima bean** carryover stocks in canners' hands, August 1, were equivalent to 4,500 cases basis 24/2's, according to the National Canners Association, which compares with the Department of Commerce estimate of 4,000 cases on Aug. 1, 1946.

**Frozen fruit** in cold storage, August 1, totaled 386,000,000 lb., which compares with 332,000,000 lb., a month earlier and 397,000,000 lb., on Aug. 1, 1946.

**Totaled vegetables** in cold storage came to 301,000,000 lb., on August 1, as against 229,000,000 lb., a year earlier.

**Frozen fish** and shellfish in storage August 1, came to 110,306,360 lb. There were 126,836,809 lb. in storage on the same date last year.

**Freezer** occupancy gained 1 percent in July, standing at 79 percent, August 1. Cooler occupancy went up 2 points, being 76 percent occupied, August 1.

### Indexes

**The commodity** price index on food, compiled by the New York Journal of Commerce, was 260.0 for the week ending September 6. This compares with 198.3 for the preceding week, 198.4 for August, and 132.4 for September, 1946.

**Business Week's** index of business activity stood at 183.9 for the week ending August 3, moving little from the 183.7 of the previous week. A month ago it was 185.1, and a year ago, 183.3.

# CONSTRUCTION NEWS

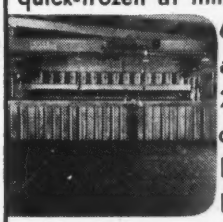
| | Pending (thousands) | Awarded Sept. (thousands) | Total Awarded 1947 (thousands) |
|---|---|---|---|
| Bakery | $ 260 | $... | $15,952 |
| Beverages | 2,019 | ... | 29,986 |
| Canning and Preserving | 400 | ... | 534 |
| Cold Storage | 60 | ... | 2,633 |
| Confectionery | 750 | ... | 514 |
| Grain Mill Products | 115 | 205 | 26,137 |
| Ice, Manufactured. | ... | ... | 355 |
| Meats and Meat Products | 1,110 | ... | 5,151 |
| Milk Products | 2,185 | 149 | 6,585 |
| Miscellaneous | 2,785 | 110 | 13,432 |
| | $9,684 | $464 | $101,279 |

*Pratt & Whitney Keep This Room at 68° F. the Year 'Round.*

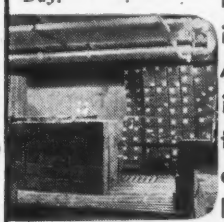
Hold Any Temperature You Want with

FRICK Refrigeration

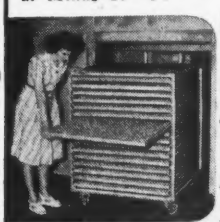
"Cold" down to 130 degrees below zero F. is now common in research and test work. Penicillin is dried at minus 75. Foods are quick-frozen at minus 30 to minus 60; are stored at zero to minus 20. Ice is frozen commercially in brine at 16. Fresh foods are held at 34 to 36. Drinking water is cooled to 45. Air conditioning, at 70 to 85, tops the scale of refrigerating loads. • Whatever the temperature wanted, you can hold it most dependably with Frick Refrigeration. Sixty-five years' experience says so!



*One-man Ice Plant Makes 42 Tons a Day.*



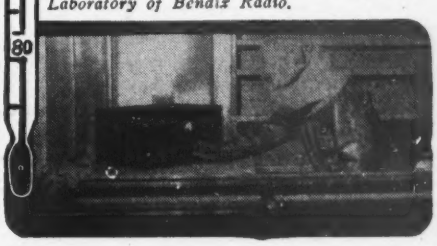
*Frozen Foods Stored at Minus 10° F.*



*Frick-Freezer Held at Minus 35° F.*

FRICK CO. WAYNESBORO, PENNA. U.S.A.

*Testing at Minus 76° F. in Refrigerated Laboratory of Bendix Radio.*



Silicone News

DC SILICONES

**DC ANTIFOAM A**

***cuts production costs***

Excessive foaming in process industries is often very costly in time and materials. This is particularly true now that both materials and labor are at a premium. Process engineers are therefore more eager than ever to try various antifoam agents in the hope of finding one which will more completely or more economically solve a foaming problem.

Antifoam agents effective at a reasonable cost in a wide variety of aqueous systems have been particularly hard to find. That is why there has been so much interest in the silicone antifoam agent recently developed by Dow Corning. DC Antifoam A is available in commercial quantities and is being used profitably in the manufacture of adhesives, paint and varnish, gums and synthetic waxes, tars and asphalts, paper, synthetic rubber, soaps, and in the processing of many chemicals.

An example of the relative economy and effectiveness of DC Antifoam A compared with other popular foam killers is given below.

| Foam Suppressor | Cost per Pound | Pounds Required[1] | Cost of Defoaming |
|---|---|---|---|
| A | $0.01 | 200.00* | > $2.00 |
| B | 0.07 | 22.80 | 2.96 |
| C | 0.13 | 15.48* | > 2.01 |
| D | 0.15 | 40.60 | 6.09 |
| E | 1.05 | 3.90 | 4.10 |
| DC Antifoam A | 7.30 | 0.018 | 0.13 |

[1]Pounds required to reduce life of a unit volume of foam to 1–5 seconds in 1,000 pounds of a solvent-water system containing 60 parts ethylene glycol, 3 parts morpholine oleate and 40 parts water.
*Not effective.

In most cases the cost of using DC Antifoam A is negligible compared with savings in the materials being processed, in the time required for processing, and in the labor necessary to control the process. More data about DC Antifoam A is given in our new leaflet No. O 6-4.

**DOW CORNING CORPORATION**

**MIDLAND, MICHIGAN**

New York • Chicago • Cleveland • Los Angeles
In Canada: Fiberglas Canada, Ltd., Toronto
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Dow Corning

FIRST IN SILICONES


# What Washington Thinks

**By R. S. McBRIDE, Washington, D. C.**

PLENTY OF SPICE—Spices have been dropped from the list of commodities that are to have international control under International Emergency Food Council. Explaining this IEFC says, "Future supply prospects for pepper and other spices now appear sufficiently adequate to obviate any possibility that the need for allocation recommendations on these commodities would again arise." However, the committee on cocoa and spices, which made this announcement, points out that it must meet in October to consider development of a new allocation plan for cocoa for the year ending October 1, 1948.

TAX HEARINGS—House of Representatives committee hearings this fall on taxes will consider all kinds of revisions. A comprehensive rewriting, simplification, and cut-back of taxes is talked. Any food group wanting to present arguments should secure time at the appropriate stage of the hearings.

EXIT ICE—Federal officials seeking more economically cooled or cold transportation facilities continue to press for development of new mechanical refrigerated transportation units, for both rail and road vehicles. Apparently it is the increasing belief of the government men that the result is both more dependable food preservation and more economical transportation service. Support by rail carriers is not yet enthusiastic, some believe in Washington.

EMPLOYEE RELATIONS—Congress has instructed its joint committee of senators and representatives to watch the labor situation closely during the present adjournment. The U. S. Chamber of Commerce is urging on this committee its ideas regarding employer rights, with some special emphasis on effectiveness in production. Urgently needed, according to the chamber, are "permanent friendly cooperation" and "greater productivity" to justify higher annual wages. Some Washington observers, with a long view on these matters, are urging that employers talk with their congressmen, while they are at home during the fall, to be sure that they understand the real problems involved in keeping retail costs down while hourly wage rates and the unit costs of raw materials continually advance. Members of both Houses need to know that serious results will happen to industries in their districts if the present tendencies are in any way encouraged further by federal laws.

MONOPOLY CHARGES—Both Federal Trade Commission and Department of Justice are renewing campaigns under their authority for anti-monopoly industry control. The efforts of each are intensified by a bit of competition between the two. Each would like to prove to Congress that it is the more important anti-monopoly agency.

EGG QUALITY—A special campaign is being conducted to secure the production of better quality eggs. The Department of Agriculture is campaigning with producers and handlers giving a warning about deterioration through drying out, odor absorption, and actual spoilage. More extensive use of cooled storage is sought nationally. Maintenance of reasonably high humidity in storage is urged to prevent evaporation through the shell. Humidity of 85 to 90 percent in storage spaces between 35 and 50 deg. F. is preferred. Egg users in industry are being asked to cooperate, as well as farm and distribution groups.

BRITISH FOOD—Two major schools of thought argue endlessly about the Capital. One group thinks that American aid to Britain in food supply tends to pauperize the British and delay their effort for self service. These critics are, of course, inclined to blame American aid in part for the strengthening of socialism in the

**CHANGE OF ADDRESS**

DIRECTOR OF CIRCULATION, FOOD INDUSTRIES
330 WEST 42nd STREET, NEW YORK 18, N. Y.

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British government. The other group talks about "our duty" and payment by the American people for the protection against Hitler afforded for several years before we got into the war. Neither group has any persuasive guess as to what present further spending restraints in Britain are going to mean to American eaters. There seems to be a little advantage with the group which argues that as Britain attempts greater austerity Americans can eat more and ship less. The arguments of none of the groups tend to improve relations between the nationals of the English speaking countries.

**NEW FEE SYSTEM**—Inspection of packing plants by Bureau of Animal Industry is now under a fee system. Packers repay the government for inspectors' wages and expenses. The typical inspector gets $89.60 per week, if employed only in normal working hours. Overtime is charged at $4.82 per man-hour; and holiday service on normal working days is at $3.88. The packers can get from these figures a clear idea as to the rates of compensation of the men who supervise their operations. They can see where approximately $11,000,000 annually goes.

**POTATOES FOR FEED**—Aggressive effort of the Department of Agriculture is promised in arranging to utilize surplus potatoes as supplemental livestock feed. Any division of industry that believes it can help use up what is otherwise spoilage and waste is urged to communicate with department representatives. Obviously, potatoes will not be used as feed where they can be safely stored, exported, or given away to charitable or other eligible institutions for food usage. Diversion to alcohol making and to livestock feeding takes second place to all of these other applications.

**SEEKING "JOSEPH"**—Weather troubles with corn threatening a short crop after more than seven years of plenty has inevitably made Washington recall the seven lean years for which Joseph made effective preparation in Egypt. Comparable planning for adjustment of production schedules at food plants may ultimately not be needed. But top executives and plant managers can both sleep better if they figure out what they can do, if anything, should a long-term period of scarcity of important agricultural materials develop. Alternates for raw materials and modified technology for each possible condition should be worked out in many cases. Washington may have to be advised of these plans, and its approval secured wherever federal regulation or interference with management might develop. Contingency programs of this sort can be discussed comfortably this winter in Washington; but there may be all too little time later should a second short-crop threaten in 1948.


**extremely high detergency under adverse operating conditions**

**SANTOMERSE No. 1**

**in bead or flake form now readily available**

In all cleansing, scouring and washing operations, Santomerse No. 1—is immediately active in penetrating and loosening soil deposits. As these deposits are freed, they are maintained in suspension, so that subsequent action and rinsing remove soil without redeposition. This multiple detergent action is only one of the many properties of Santomerse No. 1 that make it the truly modern, all-purpose synthetic detergent and wetting agent.

A prominent characteristic of Santomerse No. 1 is its detersive action in extremely hard water. It is outstandingly effective at any pH in hot or cold solutions.

The washing, wetting, dispersing and emulsifying properties of Santomerse No. 1—and their superiorities in industrial and household applications—are fully discussed in Monsanto's new Application Data Bulletin No. P-118. Send for your copy—also request additional copies for others in your organization who may be interested... Contact the nearest Monsanto District Sales Office, or write to MONSANTO CHEMICAL COMPANY, Phosphate Division, 1700 South Second Street, St. Louis 4, Missouri. District Sales Offices: New York, Philadelphia, Chicago, Boston, Detroit, Cleveland, Cincinnati, Charlotte, Birmingham, Los Angeles, San Francisco, Seattle. In Canada: Monsanto (Canada) Limited, Montreal.

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SERVING INDUSTRY . . . WHICH SERVES MANKIND

# of Emulsol Surface Active Food Materials

Whatever your needs, whatever your particular problem, there's an Emulsol Surface Active Food Material to assist you. Versatility, quality and satisfaction are the cornerstones of the Emulsol Corporation.

Some typical products:

*Frozen Specialty Egg Products* — Controlled pack to your specifications.

*High Foaming Odorless Albumen Z* — The latest advance in the dried Albumen field.

*Emcol MS* — Glyceryl monostearate—high monoester non self-emulsifying type.

*Emargol* — Ester type margarine emulsifier and anti-spatterer.

*Emcol 14* — Polyglyceryl ester — emulsifier, anti-foamer, baking texturizer.

*And* the finest "know-how" technical service. Send us your problem on your letterhead and, at no cost to you, we will send you the most effective answer.

## THE EMULSOL CORPORATION

**59 East Madison St** **Chicago 3, Illinois**

# MEN • JOBS • COMPANIES

CHARLES W. KAUFMAN

**Newly appointed director of research and development for General Foods Corp., Charles W. Kaufman will direct the corporate research program at the corporation's central laboratories, Hoboken, N. J.**

DR. WILLIAM D. McFARLANE

**For the past 11 years, chairman and professor of chemistry, McGill University, Dr. William D. McFarlane has been appointed director of research for the new Canadian Brewers Ltd., research institute, Toronto.**

DR. WARREN H. GOSS

**Resigning as assistant to the director, Northern Research Laboratory, Peoria, Ill., Dr. Warren H. Goss becomes an associate director, research and products development, Pillsbury Mills, Inc.**

## INDUSTRY

**The F. X. Baumert** soft cheese plant, Antwerp, N. Y., owned by Borden & Co. since 1928, has been closed and offered for sale. Only Camembert had been manufactured at the plant since Borden's transferred the other operations to its Vant Wert, Ohio, plant, a year ago.

**Bridgford Co.**, West Coast frozen food packers, recently appointed B. E. Lesley director of research in charge of quality control. Mr. Lesley is a former chief chemist of California Packing Corp., and was more recently director of research for California Conserving Co., now Hunt Foods, Inc.

**Florida Southern College**, Lakeland, is inaugurating a course in production, processing, packing and marketing of citrus fruit. David R. Langfitt is director of the program.

**Gerber Products Co.** employees recently voted to change their union affiliation to the Food Workers division, United Retail, Wholesale and Department Store Employees (CIO). They were formerly affiliated with the Food, Tobacco and Agricultural Workers, also a CIO union.

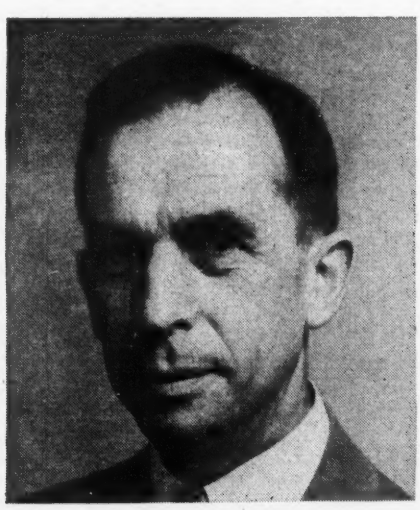
**Grocery Manufacturers of America** has promoted Dan V. Kilfoyle to the post of assistant to the president and added Robert H. Bingham, former OPA economist, to its staff.

**Douglas McBean, Inc.**, Rochester, N. Y., consulting engineers, have opened branch offices at 61 W. 56th St., New York City.

**McPhail Candy Corp.**, Chicago, recently placed four former members of the National Candy Co. staff. Sam T. Gay has been named vice-president and general manager, Leo P. Luning is the new controller, C. M. Said becomes merchandising director, and

JAMES J. CUNNINGHAM

**Recently appointed Pacific Division manager of the White Rock Corp., James J. Cunningham will have charge of the corporation's operations for the entire Pacific coast.**



FRANK B. CLIFFE

**Until recently, assistant controller at General Electric Co., Frank B. Cliffe has been named controller and treasurer of H. J. Heinz Co., Pittsburgh. He leaves GE after 27 years with that company.**

E. B. CLEBORNE

**Recently elected executive vice-president, Allegheny Ludlum Steel Corp., E. B. Cleborne assumes his new responsibilities after nine years as a vice-president and director of the corporation.**

**Power Engineers Agree. . . .**
**It's the GUTS that make**
**STEAMASTER a GOOD BOILER**

**WATER TUBE DESIGN**

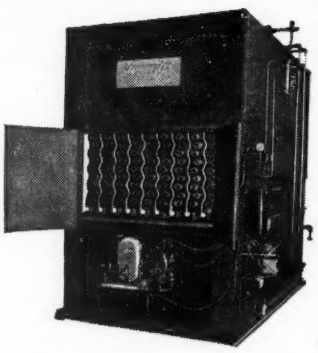
**INCLINED TUBES**

**SECTIONAL STEEL HEADERS**

**LONGITUDINAL DRUM**

**The GUTS of the Steamaster Boiler**

**The food industries NEED BOILERS with PLENTY of GUTS!**



In design, construction and materials, Steamaster builds boilers with the guts to give reliable efficient performance year in and year out.

**QUICK FACTS about the advantages of the STEAMASTER Water Tube BOILER.**

- ***All Steel Construction.***
- ***Positive Tidal Circulation of Water***—Maintains all parts at equal temperature.
- ***Condensate Return System Built-in*** as an integral part of all boilers of 60 h.p. and up.
- ***Easy Inspection and Maintenance***—Every tube immediately accessible. Just open the heavily insulated access doors.
- ***Large Combustion Area . . . Three Pass.***
  ***Heat Baffling*** gives high thermal efficiency.
- ***Choice of Fuel—Gas, Oil or Coal*** or any combination of these fuels to meet the fuel requirements of your plant.
- ***Fully Equipped for Automatic Operation***—Finest accessories.
- ***A.S.M.E. Code—National Board Approved***—Inspected and certified by Hartford Steam Boiler Inspection and Insurance Co.
- ***Full Range of Sizes*** from 10 h.p. to 300 h.p. as illustrated. The Model A for 3½ h.p., 5 h.p. and 7½ h.p.
- ***Can Be Fired Over Rated Capacity*** . . . without loss of efficiency.

Throughout the Food Industries you will find Steamaster Automatic Boilers giving consistently excellent performance at low cost.

***Power Engineers Agree:***
**STEAMASTER is the Boiler with PLENTY OF GUTS!**

Steamaster
**AUTOMATIC BOILER CO.**
**5817 Compton Ave. Los Angeles 11, Calif.**
***Sales and Service in all Principal Cities***

Frank T. Glenn is general superintendent. National's interests were purchased sometime ago by Chase Candy Co., St. Joseph, Mo.

**Old Dutch Foods**, Buffalo, N. Y., has bought the mustard making machinery and vats of the Wilson Vinegar Co., Wilson, N. Y., and plans to start production of mustard, at its own plant, in about two months.

**Pet Milk Co.** has begun construction of a plant for the manufacture of tin cans for its homogenized milk products, at Bryan, O.

**Southern Bakers Association** has elected E. F. Cline, Columbus, Ga., as president, succeeding W. J. Colby, Birmingham, Ala., who becomes vice-president. Faber A. Bollinger remains secretary.

**Stokely-Van Camp** has purchased the citrus packing plant of the Polk Co., Tampa, Fla., and with it the right to use the Polk brand name.

**Swift & Co.**, Chicago, recently bought the Biltmore Farms ice cream plant, Coral Gables, Fla. Operations were begun in August, and the plant's production capacity will be increased as soon as materials are available.

## PERSONNEL

**Dr. C. Olin Ball** has agreed to direct research in food technology for The United Co. and its affiliate, The United Products Co., whose work on the development of Creamogenized corn was recently announced. Dr Ball will continue with his newly launched activities as a consultant in food technology as well as the operation of his research laboratories, in Maumee, O.

**George H. Berryman**, former director of the Medical Nutrition Laboratory, has been appointed chief of the nutrition branch of the Quartermaster Food and Container Institute, Chicago. Harry L. Fevold, formerly with Western Regional Laboratory, becomes chief of the Institute's product development division.

**Dr. Sidney M. Cantor**, until recently assistant director of research of Corn Products Co., has been appointed director of research for The American Sugar Refining Co.

**Dr. Robert H. Cotton** has resigned as director, Plymouth division, National Research Corp., and is now doing research on citrus processing for the Agricultural Experiment Station, University of Florida.

**Laurence P. Geer**, formerly with the Forchin Laboratories, Tampa, Fla., is now head of the chemistry department, University of Tampa.

# 9 REASONS WHY IT PAYS TO BUY TRUCK BODIES BY FRUEHAUF

1. 12 - 14 - 16 ft. sizes available in hundreds of combinations.
2. Durable, all-steel Aerovan-type construction, including doors.
3. Exceptional strength—yet light in weight.
4. Side and rear door design to fit user's need.
5. Heavy-duty Trailer-type cam door locks.
6. Fruehauf's famous steel-ribbed reinforced 1-1/16 inch flooring.
7. Available with open or closed tops —one-piece, reinforced roof coving.
8. Fruehauf nation-wide Factory Branch distribution centers relieve you of all assembly and mounting work. Also available in K. D. form.
9. Top-quality construction—at production-line prices!

YOU know what the name "Fruehauf" means on a Trailer—now, you can buy the same engineering skill in a top-quality Truck Body at a production-line price. With 4-basic models and hundreds of combinations to choose from, you'll find it easy to select the exact body you need from the Fruehauf line.

There's a Fruehauf Factory Branch right in your locality which stocks these models and backs sales with Factory Branch Service facilities. This eliminates costly layups should servicing be necessary.

See these tailor-made bodies now on display at your nearest Fruehauf Branch!

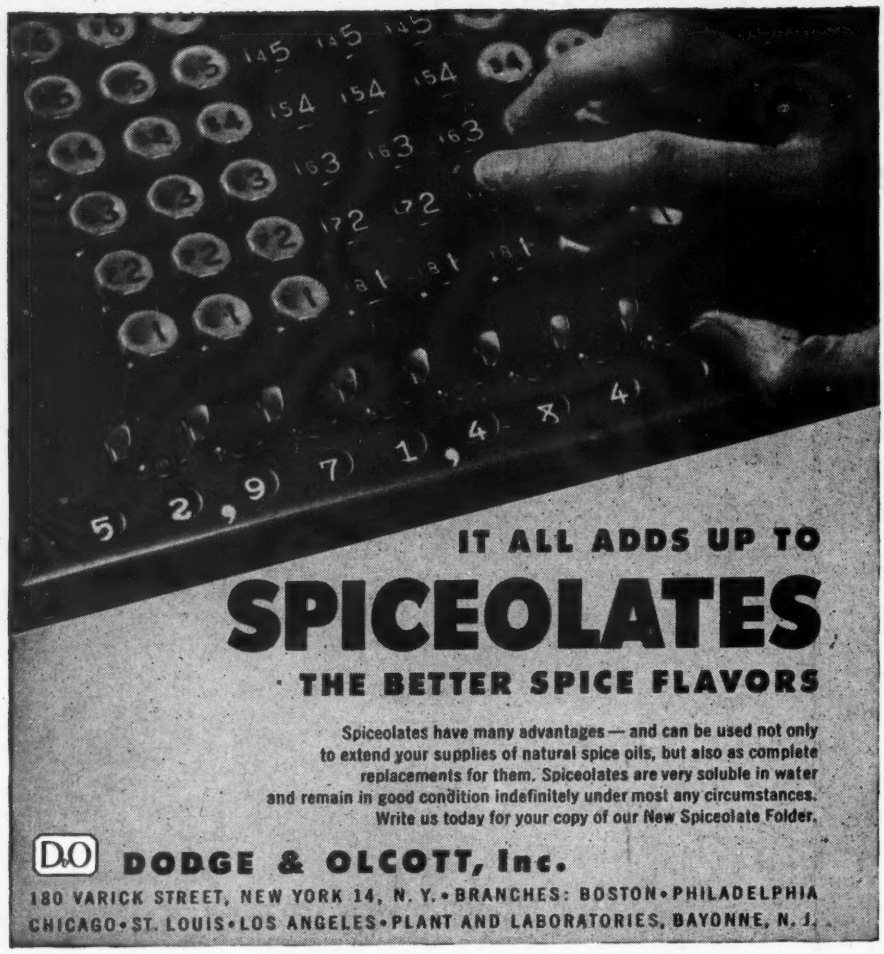
*Base price 12-ft. van body less doors, K. D. Assembly and mounting on truck chassis ready for finish paint, $50. additional. Taxes extra.

SPECIFY FRUEHAUF
The Name that Carries Weight!

BODY DIVISION
FRUEHAUF TRAILER CO. • DETROIT 32
69 Factory Service Branches

4 Basic Models . . . Hundreds of Combinations!

FRUEHAUF TRUCK BODIES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SPICEOLATES
THE BETTER SPICE FLAVORS
Spiceolates have many advantages — and can be used not only to extend your supplies of natural spice oils, but also as complete replacements for them. Spiceolates are very soluble in water and remain in good condition indefinitely under most any circumstances. Write us today for your copy of our New Spiceolate Folder.
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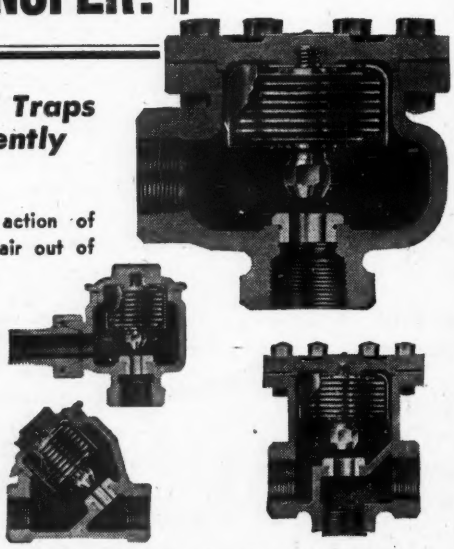
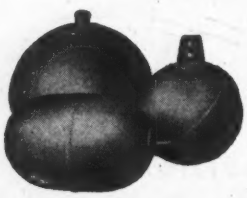
DOES AIR SLOW UP YOUR HEAT TRANSFER?

*Nicholson "Fast Action" Traps Discharge Air as Efficiently as Water*

The positive, frequent intermittent action of Nicholson steam traps tends to pull air out of the system to the trap, where it is readily eliminated, speeding heat transfer. Installations result in production increases up to 30%.





Nicholson is one of America's largest makers of welded floats for operating mechanisms and as H. P. storage vessels. All sizes and shapes. Bulletin 746.

5 TYPES FOR EVERY APPLICATION—process, power, heat. Size ¼" to 2"; pressures to 225 lbs. Bulletin 544 or Sweet's.

**W. H. NICHOLSON & CO.**
193 OREGON ST., WILKES-BARRE, PA.
*Valves • Traps • Steam Specialties*

**Warren F. Keller** has resigned his position at Allis-Chalmers Mfg. Co., Milwaukee, to become professor of milling industry at Kansas State College.

**L. Charles Mazzola** has resigned his post as executive vice-president of Riverbank Canning Co., to join Claridge Food Co., Flushing, N. Y., as sales manager.

**W. S. Obenshain,** Charlotte, N. C., has been appointed executive vice-president of Southern Dairies, Inc. He has been with the company for 32 years and had been serving as zone manager until his appointment. Mr. Obenshain will be succeeded by Russell E. Tucker, also of Charlotte, as zone manager.

**Walter J. Reese,** former director and vice-president of Campbell Soup Co.'s central division, Chicago, has been elected a director and vice-president-assistant to the president of the company.

**G. E. Richardson,** general manager of the Cudahy Packing Plant at Denver, Colo., has been named general manager of the company's Los Angeles plant, succeeding W. V. Pace, resigned. Carl F. Albrecht, formerly in charge of fresh pork and provision sales in Chicago, succeeds Mr. Robertson at the Denver plant.

## DEATHS

**Prof. Charles E. Abbott,** 54, professor of horticulture, University of Florida, August 14, at his home in Gainesville.

**Claude S. Beall,** 65, head of the sausage and casings Division, American Meat Institute, in Rochester, Minn.

**C. D. Bigelow,** 62, secretary, George A. Hormel and Co., recently in Syracuse, N. Y., while enroute to Hyannis, Mass.

**William E. Boyer,** vice-president and general sales manager, the Clicquot Co., August 8, at Needham, Mass.

**John S. Cox,** 63, until his retirement manager of a group of H. P. Hood & Sons milk plants in Northern New England, August 9, at Boston.

**R. Graves Craddock,** 43, owner of the Ridgely and Realfoods Canning Cos., in Tennessee, July 21. He was instantly killed by the accidental discharge of a gun.

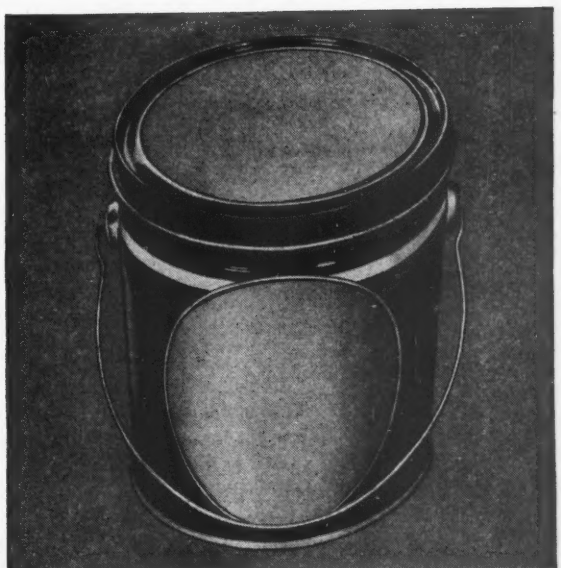
**John R. Davies,** 58, head of the dessert products section, General Foods' central laboratory, August 11, following a heart attack at his home in Short Hills, N. J.

# *We're catching up!*

**Production's galloping ahead**—and although orders are still slightly in the lead at present, we're hoping to fill them soon.

The outlook is bright because our facilities for turning out cans have been vastly expanded, and today many raw materials are being scratched off the "shortage" lists.

Please accept our thanks for your patience during the "shortage years," and don't hesitate to call us if you'd like further information. Just contact the nearest Continental sales office.



Lard and compound cans and pails are available in 4, 8, 25, 50 and 110-lb. sizes. Either flaring or straight side. Plain or lithographed with your own design.

**CONTINENTAL CAN COMPANY**

100 EAST 42nd STREET, NEW YORK 17 N. Y.

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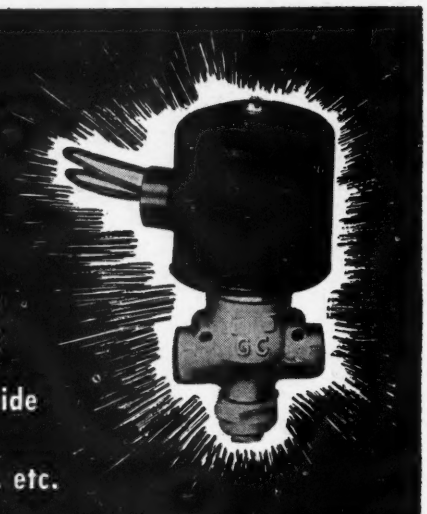
ELECTRO-MAGNETIC
VALVE



THE UNSURPASSED
REFRIGERANT VALVE

For Freon Methyl Chloride
Sulphur Dioxide
also Air, Water, Gas, Light Oils, etc.

PROVIDES on and off control of liquid or suction lines. Used with standard thermostats for positive control of refrigerants in either defrosting or reverse cycle systems, multiple temperature processes or with by-pass or unloading valves. Bodies are die forged and all internal parts are bronze or stainless steel.

FOR AUTOMATIC CONTROLS specify General Controls. Request new Catalog 52C, Automatic Pressure, Temperature and Flow Controls.

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801 ALLEN AVENUE GLENDALE 1, CALIF
Manufacturers of Automatic Pressure, Temperature & Flow Controls
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KANSAS CITY • NEW YORK • DENVER • DETROIT • CLEVELAND • PITTSBURGH
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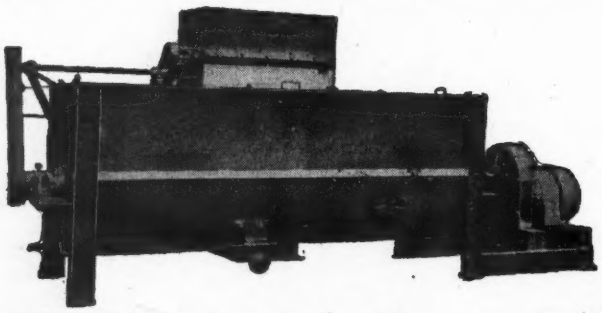
253



ROBINSON
PROCESSING UNIQUE EQUIPMENT

MIXER . . . with Brush Sifter!



Capacities from 1 to 234 cu. ft. per charge. Agitator design relieves end-load strain on outboard roller bearings. Inlet and discharge gates centrally located. Flush-fitted or sealed covers. Packing glands conveniently situated on Mixer body. Designed by experienced engineers and built to specifications. Robinson Equipment is available for all processing requirements . . . mixing,, grinding, sifting, crushing, blending, etc. Inquiries invited!

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Plant: Muncy, Pa.
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30 CHURCH ST., NEW YORK 7, N. Y.


**Dr. Henry A. Hoffman,** 54, in charge of the animal pathological laboratory of the California State Dept. of Agriculture, July 19, near Echo Lake, Calif.

**Dwight H. Mahan,** 56, vice-president, College Inn Food Products Co., August 6, at his home, La Grange, Ill.

**John R. Morris,** 75, vice-president, International Milling Co., until his retirement in 1937, August 5.

**David Morrow,** 62, plant superintendent, Kingan & Co., recently, in Indianapolis. He was with that company since 1906.

**Dr. Homer H. Plagge,** 53, Iowa State horticulture department, recently, of a heart attack while attending a conference on food technology at the college.

## ASSOCIATED INDUSTRIES

**The Arabol Mfg. Co.,** New York adhesive manufacturers, have acquired the St. Louis Chemical & Mfg. Co., St. Louis, Mo. The plant will expedite the manufacture and delivery of adhesives to users throughout the nation.

**Barliant and Co.,** Chicago, have opened a supplies and special equipment department for the food processing industry.

**The Diaphane Bag Corp.** of Pennsylvania, Philadelphia, is changing its name to the Diaphane Corp. The corporation also announces the election of Lewis Hart as vice-president in charge of sales.

**The Pennsylvania Salt Mfg. Co.,** Philadelphia, has completed a new manufacturing unit, which greatly expands production of the insecticide benzene hexachloride, at Natrona, Pa. The company has also appointed Dr. Ford R. Lowdermilk supervisor of the development division in its research and development department.

**J. J. Shanahan** has opened offices in Washington, D. C., to represent food equipment manufacturers interested in selling their equipment to the U. S. and foreign government.

**Wyandotte Chemicals Corp.,** Wyandotte, Mich., has named Dr. A. Lloyd Taylor research supervisor, where his experience will be applied in the field of industrial detergents. Dr. Taylor is a former vice-president in charge of research and development for H. L. Shaw and Sons, Portsmouth, N. H., and Boston.

*You Get That Dependable Twist in Pretzel Production with*

# GAS COOKING EQUIPMENT

Modern Gas-fired Flex-O-Matic oven and cooker emphasizes the cleanliness and operating efficiency of Kessler's Pretzel Bakery.

Kessler's Pretzel Bakery, Tell City, Ind.

The tricks of food specialty production are pointedly evident in pretzel manufacturing. In cooking this popular food staple accurate control of temperature and fuel economy are vital profit factors.

That's why successful bakers like Kessler's of Tell City, Indiana, have adopted GAS and modern Gas Equipment. Kessler's have used GAS since 1937; they praise the cleanliness, fuel economy, and streamlined efficiency resulting from their adoption of Gas Equipment.

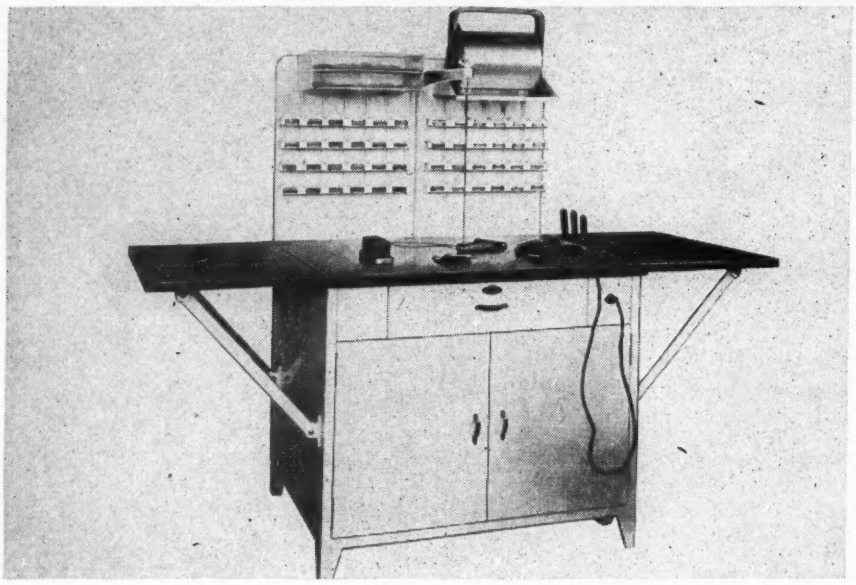
Mr. Irvin C. Kessler states, **"We use GAS for baking, water heating, and space heating—we find it efficient, economical, and dependable, supplying the correct temperatures for all purposes whenever and wherever we want heat."**

Wherever heat is required for baking, cooking, toasting or other food industry processes GAS and modern Gas Equipment will fulfill the most exacting requirements—automatic temperature control, sanitation; cleanliness, rapid heating, flexibility of application. Your local Gas Company Representative will bring you up to date on modern Gas Equipment for every food processing requirement.

Photos by Union Steel Products Company, manufacturers of Gas-fired Flex-O-Matic Ovens.

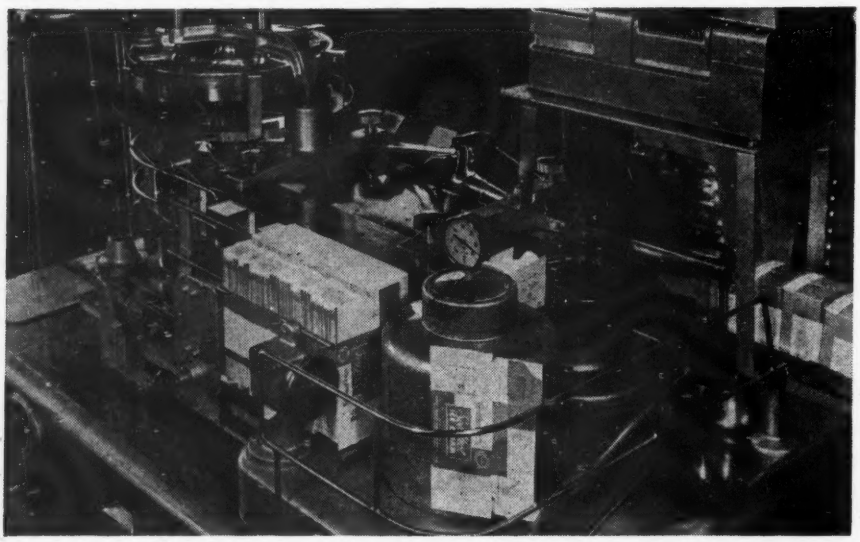
**AMERICAN GAS ASSOCIATION**
420 Lexington Ave., New York 17, N. Y.

# FOOD EQUIPMENT NEWS



## Wrapping Table for Self-Service Dairy 1

THE Hill Model WC9D wrapping table, a compact table designed for the merchant wishing to do his own preparing, wrapping and labeling of self-service dairy products, is announced by C. V. Hill & Co., Inc., Dept. I, Trenton, N. J. Requiring only a few feet of floor space, the table is equipped with electric sealing iron, tight and loose wire cutter, label dispenser and labels, knife, scraper, and other essentials. The base, which is constructed of heavy gage metal, can be used as a utility locker. The top is of white rock maple and with drop leaf extensions which, when opened, give a working space of 32 x 82 in. A similar table and accessories have been designed for the wrapping of meats for self-service.

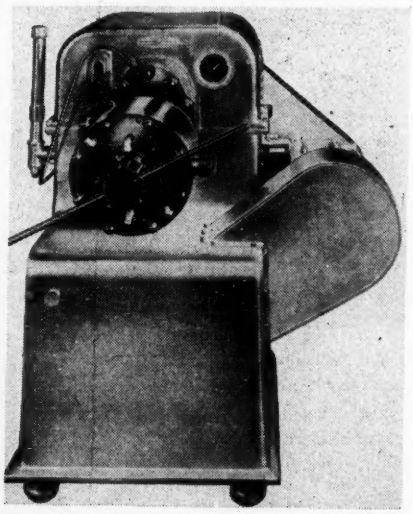


## Fully Automatic Ice Cream Packaging Machine 2

PURE-PAK Div. Ex-Cel-O Corp., Dept. I, Detroit 6, Mich., has just introduced a fully automatic portable ice cream packaging machine designed to fill from 15 to 60 pts. per min. The operating cycle is one of beginning on one side of the machine with a flat carton and ending on the other side with a filled and closed container. Design of filling head permits packaging from one, two or three continuous freezers. Stainless steel and Waukesha metal are used for all parts that come in contact with the ice cream. Motor and drive gears are entirely enclosed under the stainless steel cabinet. Variable speed control requires only a turn of the hand wheel to synchronize speed of machine with freezer production.

## Steel-Belt Conveyors 3

STEEL-BELT conveyors employing either flat or troughed belts of carbon or stainless steel are being designed and built by Sandvik Steel, Inc., Dept. I, New York, N. Y. The troughed belts can be either pre-troughed or self-troughing. In the pre-troughed belt, which is best suited for handling light, easy-flowing material such as grain, the initial trough is given to the belt during the process of manufacture. The self-troughed belt receives its trough in operation from the weight of the material carried on it. A special type of idler arrangement supports both types of troughed belts. The entire unit, including belts, idlers, motor and complete supporting structure is shipped to the user disassembled, with complete instructions for correct and easy assembling.

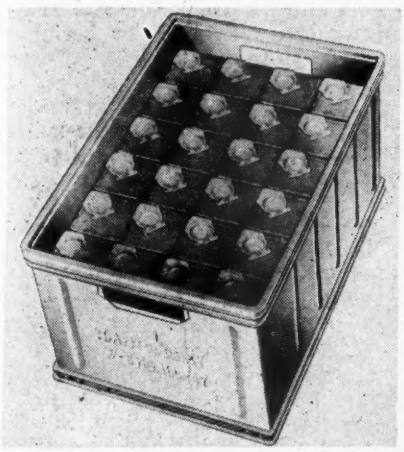


## Marshmallow Process 4

PRODUCTION of marshmallow, at a controlled rate up to 1,000 g.p.hr., by a new process using Flow Master Reactors, is announced by Marco Co., Inc., Dept. I, Wilmington, Del. The process is best operated by preparing a master blend of all ingredients. The blend is pumped into a continuous mixer where it is uniformly mixed, then moves through a series of Flow Master Reactors, where a sufficient volume of air or gas is incorporated for density control, and where materials are brought into a state of homogeneity. Features of the process include accurate product control from one extreme to another—from dense viscous nougat to light, fluffy cake toppings, with uniform quality characteristics. Adjustments are simple and easily made by inexperienced operators. The finished product is directed to depositors or packaging units.

## Dampcoat Enamel 5

A RUBBER base, 1-hr. dry, high gloss white enamel, which brings all the desirable qualities of rubber into a practical paint form for application to walls and ceilings as well as to equipment of storage and packing houses, is announced by the Wilbur & Williams Co., Dept. I, Boston, Mass. The coating is practically odorless, is resistant to the growth of mildew and fungus and may be made fungicidal. It performs satisfactorily at sub-zero temperatures, and does not discolor on steam pipes, or from other dry heat up to 250 deg. F. Available in white, light grey, black, aluminum and eight other colors.

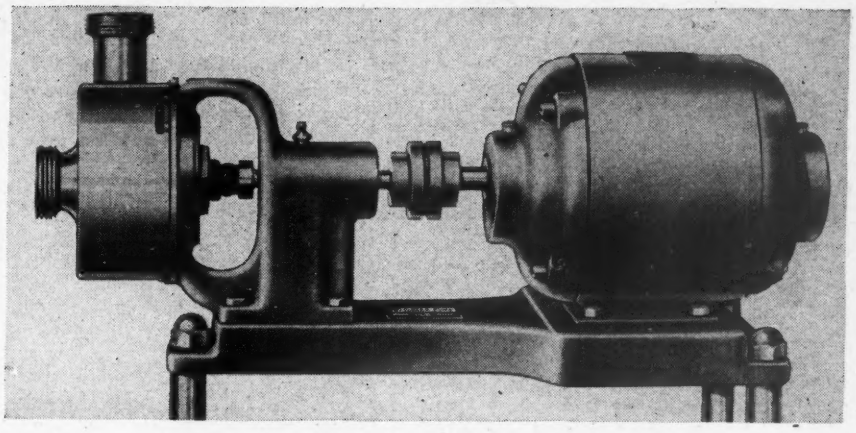


## Case for Paper Bottles 6

AN aluminum case, engineered and designed exclusively for paper milk bottles, is manufactured by Illinois Creamery Supply Co., Dept. I, Chicago 12, Ill. Made in sizes to handle 20 and 24 qt. paper bottles, the manufacturer stresses the following features: (1) By a special design of the bottom, each bottle is carried on an individual support which removes stress from the corners and prevents leakers during delivery; (2) light weight—less than half wooden case; (3) made of heavy gage extruded aluminum alloy heat treated to tensile strength of steel; (4) open bottom design permits easy cleaning; (5) special telescoping stacking feature and (6) reduced refrigeration cost.

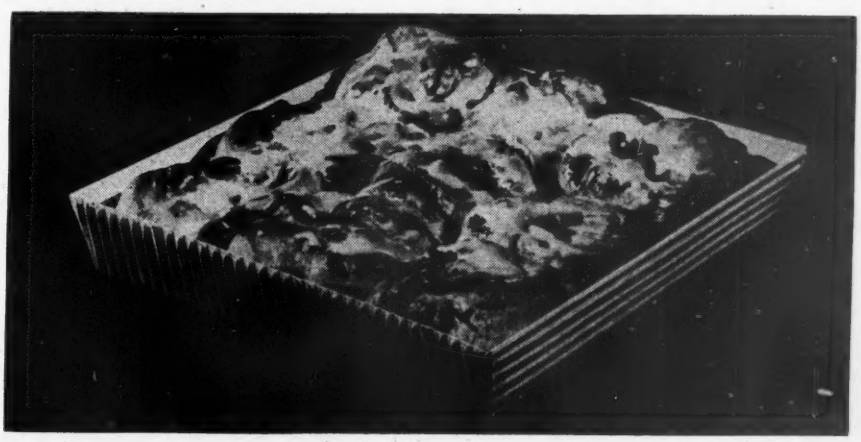
## Boiler Water Treater 7

A DEVICE that controls electrolysis, removes scale and corrosion and prevents its formation in boilers has been developed by McRay Sales Co., Dept. I, Pasadena 1, Calif. Called the McRay Electrolytic Treater, it consists of a number of zinc and copper plates mounted in series, which sets up an electromotive force and renders the salts and minerals inert. Normally installed in a pre-heater just ahead of the boiler, its action is almost immediate. According to the manufacturer it requires a minimum of attention after installation.



## Sanitary Pump for Food Industries 8

TRI-CLOVER Machine Co., Dept. I, Kenosha, Wis., announces the new "Champion" series sanitary pumps, for dairy, food processing, beverage and confectionery industry use and wherever corrosion-resistant pumps are required. Exclusive features incorporated include completely demountable head and working parts for rapid, thorough cleaning; patented carbon-faced Neoprene seals; aluminum alloy base and bracket; stainless steel legs; all contact parts of polished 18-8 stainless steel; with improved impeller and case design to provide non-agitating action on liquids or semi-solids. Two models are offered: Model MS, ranging from 0 g.p.m. at 15½ ft. head, to 66 g.p.m. at 9 ft. head; and Model S, having a range of 0 g.p.m. at 25 ft. head, to 95 g.p.m. at 0 ft. head.



## Corrugated Panliner for Yeast-Raised Products 9

A NEW type of corrugated panliner, for baking and packaging sweet goods, rolls, and other yeast-raised products, has been announced by Sherman Paper Products Corp., Dept. I, Newton Upper Falls, Mass. Unlike present types of panliners, which cannot be used satisfactorily with yeast-raised products, the new liner comes free without any sticking. It will be marketed under the brand name Corrodek "108." A number of advantages are claimed for the use of the liner: The elimination of pan greasing and scraping and constant pan washing; faster handling in packaging; added attractiveness at point of sale. The distinctive feature of the liner is a coating which gives it non-stick qualities. Almost microscopically thin, the coating is edible and tasteless, with a melting point so high that it will not soften even under extreme atmospheric temperatures.

### WRITE FOR MORE INFORMATION

**Food Industries Reader Service now makes it easy for you to follow up the news on new equipment and new materials. Tear-out coupon cards are supplied for your convenience on the special colored page which follows the equipment news section in this month's issue. Enter your requests, fill out and mail cards, and let Reader Service do the rest.**

Do you have cleaning fog? Droplets of water clinging to the alleged cleaned surface—haze on glass? Lift it easily with the more thorough, efficient cleaner—Metso. How Metso works in removing the last trace of greasy film is demonstrated in the photos above.

Metso is a scientifically balanced combination of alkali and soluble silica which steps up cleaning action. You're sure of chemically clean, greaseless surfaces.

Ask for Metso Cleaner on your next order. It's easy to use.

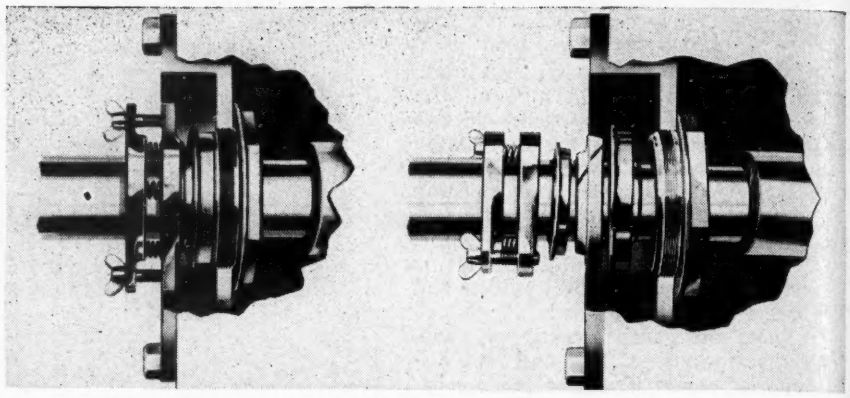
Conveniently packed in 100 pound bags and 300 pound barrels. Distributors in over 65 cities.

**PHILADELPHIA QUARTZ COMPANY**

Dept. D, 125 S. Third St., Phila. 6, Pa.

metso REG. U.S. PAT. OFF. Cleaners

METSO REG. U.S. PAT. OFF.

## Coil Pasteurizer Has Sanitary Seal 10

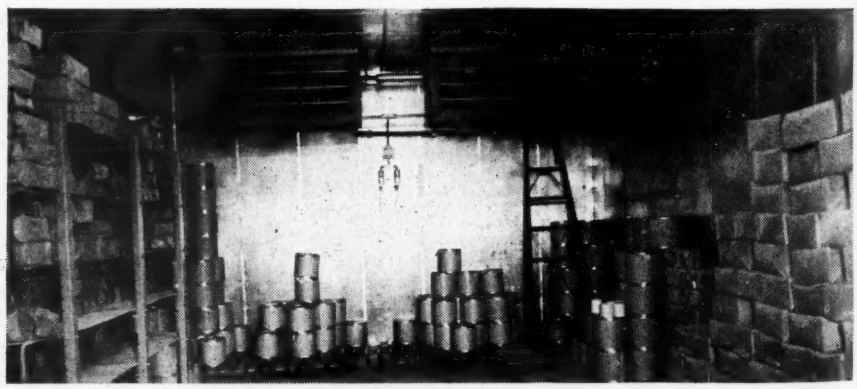
AFTER actual plant operation in several leading creameries, The Creamery Package Mfg. Co., Dept. I, Chicago 7, Ill., has announced the Wizard Coil Pasteurizer with sanitary seal, which eliminates the customary stuffing box and can be easily and readily cleaned. All that is necessary is to remove the spring retainer—slip off the split compression ring—push back the pressure ring and seal ring and complete access may be had for hosing and brushing the 4 to 4¾ in. exposed portion of the shaft surface. The split compression ring is made of flexible fat resistant plastic material.

## Plexiglas Salt Dispenser 11

TRANSPARENT, shatter-resistant Plexiglas forms the dome, hopper, cylinder and skirt of this new salt dispensing machine for handling anhydrous calcium chloride in commercial canning of tomatoes. Used as a cell strengthener to prevent softening of the tomatoes, calcium chloride presented a handling problem because of its hygroscopic property. Plexiglas is unaffected and its crystal clarity permits continuous inspection of the flow of salt and the automatic control mechanism that regulates the quantity added to each can. All parts are assembled with a special cementing technic, with tight bonding of plastic to metal, and the three plastic sections can be quickly and easily assembled. The machine was developed by Salter Machine Co., Dept. I, Oakland, Calif., with plastic parts fabricated by K-Plastix, San Francisco.

## Code Marking Machine 12

A NEW unit for code marking labels as they are being applied to round metal or glass containers has been developed by Jas. H. Matthews & Co., Dept. I, 3967 Forbes St., Pittsburgh 13, Pa. Designed for operation with all standard horizontal type labeling machines, the unit will not obstruct the working operation of any other part. Labels can be marked at whatever speed the labeling machine is being operated. The code mark is placed clearly on the label by a "scorching in" process. The unit is equipped with 115 or 230 v. a.c. or d.c. heating elements, thermostatically controlled for a 5 deg. F. variable in each direction. Light or heavy impressions are obtained as desired by heat control. The standard unit will hold up to 8 pieces of 3/32 or ⅛ in. type, which can be furnished. Special units can be made.



## Reflective Insulation Reduces Wall Thickness 13

WALL thickness in refrigerating rooms may be reduced approximately 50 percent without a sacrifice in efficiency, by constructing them with Ferro-Therm steel insulation as opposed to mass insulation, according to American Flange & Mfg. Co., Inc., Dept. I, 30 Rockefeller Plaza, New York, N. Y. Made from sheet steel with a lead and tin-alloy coating, Ferro-Therm is installed in layers with an air space between each layer. Eight sheets would be used in an ice cream hardening room. It is said to reflect 90 to 95 percent of all radiant heat, weighs 0.25 lb. per sq. ft.

# STAINLESS STEEL

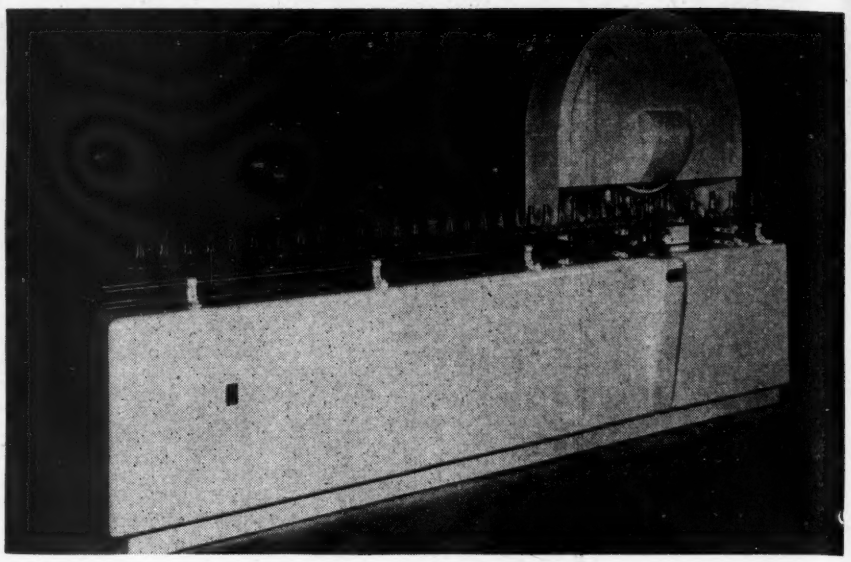
## *Going Places . . . With Food*

Looks like a new conveyor line, doesn't it? Actually this sanitary conveyor system, topped with glistening stainless steel, has been in service for a long time. Yes, "good looks" is to be expected of stainless steel. And you can count on other things, too — easy cleaning of equipment, no metallic contamination or rust. Also, stainless steel has a hard surface that neither chips nor peels. For stories of how others are using stainless steel in food processing, write to Department F-10 for our booklet "Stainless Steel — A Modern Aid to the Food Industry."

**ELECTRO METALLURGICAL COMPANY**
Unit of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.

***PRODUCERS OF ALLOYS THAT MAKE STEEL STAINLESS***

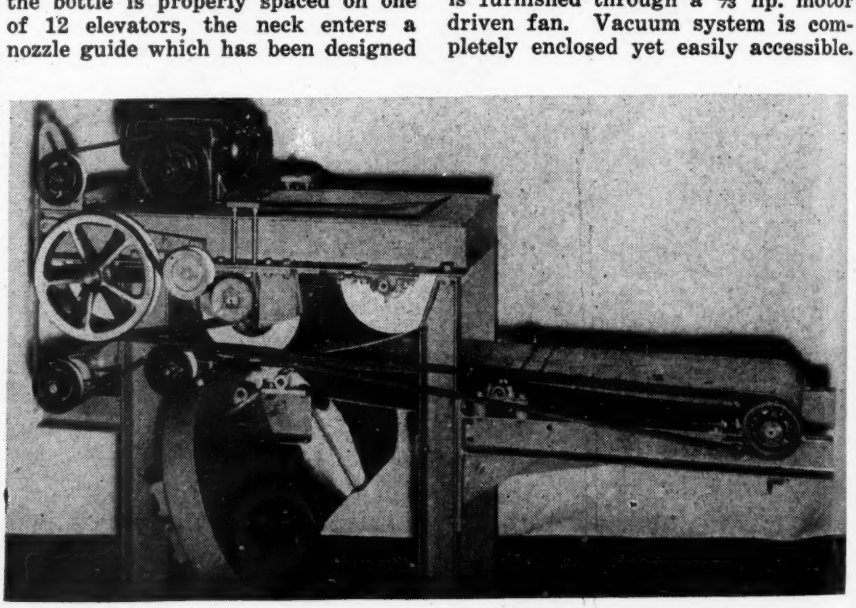
**Beautiful Enduring Strong Tough**



## Machine Dry Cleans New Glass Bottles 14

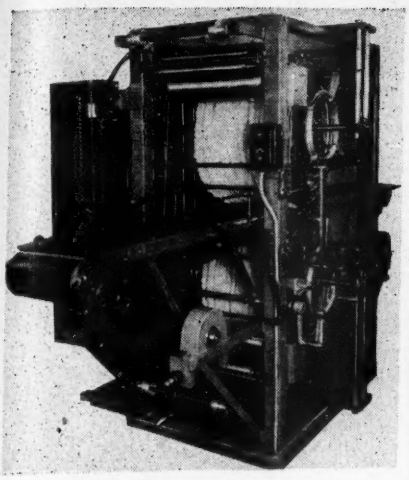
THE Roto Cleaner, a machine that air cleans almost any size bottle up to and including the qt. size, which is passed through at the rate of 120 per min., has been developed by Pneumatic Scale Corp. Ltd., Dept. I, No. Quincy 17, Mass. Containers are fed into the machine by means of a dial spider, the rotation of which is controlled by a primed line of at least four bottles ahead of it. This permits connection into a synchronized line for constant speed operation. As the bottle is properly spaced on one of 12 elevators, the neck enters a nozzle guide which has been designed so that its opening to the continuous vacuum system is sealed from the outside and the loosened dirt is removed to a closed chamber.

As the container rotates to an inverted position approximately 45 deg. from the vertical, a blowing nozzle is projected into the neck and a 60-lb. blast of air is turned on. At the end of the rotative cycle, the bottle is returned to a vertical position and delivered onto a discharge conveyor by means of a rotating spider. Vacuum is furnished through a ⅓ hp. motor driven fan. Vacuum system is completely enclosed yet easily accessible.



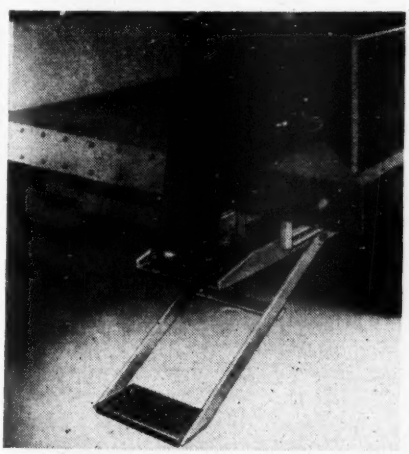
## Skins 2,500 to 5,000 Lb. Fish Per Hr. 15

A FISH skinning machine which utilizes a conveyor belt to carry the fillet to and through a water lubricated band-knife has been developed by Jensen Equipment Co., Dept. I, Seattle, Wash. After the fish have been cleaned and split into fillets, they are arranged on the belts tail first, with the side that is to be skinned next to the belt. As it approaches the band-knife, a second belt squeezes the fillet against the feed belt. Where the fillet meets the knife, a specially designed roller backing up the pressure belt molds the cut flat against the knife. As the fillet leaves the knife, a "divider rack" guides the skin downward and the fillet onward to another conveyor. The present machine appears capable of skinning between 2,500 and 3,000 lb. of sole per hour, and may be able to handle up to 5,000 lbs of the heavier types of fillets.



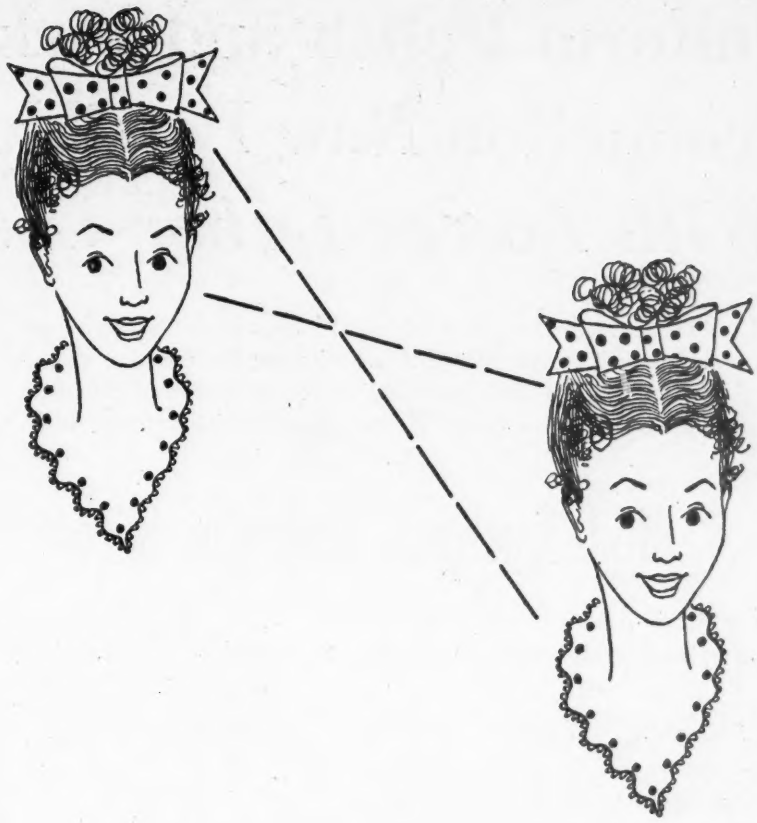
## Pliofilm Wrapping 16

FOR wrapping irregular food products, such as meats, fish, fruits, and vegetables in Pliofilm, stretching the wrapper and vacuumizing the package, Stokes & Smith Co., Dept. I, Philadelphia 24, Pa., has introduced the Stretch-Paker. To reduce the amount of Pliofilm used, the material is heated, held firmly by grippers and stretched as the objects are wrapped. The machine has two large flexible hollow wheels with rubber faces which may be inflated to any desired degree. Surrounding the rubber surface of both wheels are continuous brushes which rotate with the wheels, pressing down Pliofilm around objects and removing air pockets from the final package. Packages are vacuumized by means of pipes, projecting between the films and the object as it is being wrapped. Pipes are hinged and a spring brings them together on each side of the object. More exhaust pipes can be used if needed.



## No Break Truck Step 17

THE Extendo Corp., Dept. I, Los Angeles 27, Calif., is manufacturing the new Extendo No Break truck step, outstanding feature of which is that it will not break off should the driver forget to retract it. The unit merely slides back into its frame or rack if the truck is backed up against a dock, wall or other obstacle. Step is attached to the truck by four bolts.

# . . . but no two cleaning compounds are alike

If you want to be sure of maximum cleaning efficiency at minimum cost, select the Wyandotte Product or Products especially designed for *your* particular cleaning needs.

If the problem is general cleaning of food-processing equipment, use Wyandotte G.L.X.* A new kind of cleaner and water softener, G.L.X. leaves stainless steel and other surfaces clean, lustrous, free from film. It works effectively even in the hardest water.

For washing fresh fruits and vegetables, in hard or soft water, Wyandotte Citrifoam* is highly recommended. A sudsy but soapless cleaner, Citrifoam goes into solution quickly, cleans thoroughly, rinses freely.

Another specialized cleaner of outstanding value in food plants is Wyandotte S.R.-10. This cleaner not only removes stains from equipment, but also assists in the removal of stubborn scale deposits.

Wyandotte Steri-Chlor* is a quick, effective germicide for use on all equipment after cleaning has been done. Steri-Chlor is safe on metals and clothing, and it leaves no taste or odor after use. You'll find it invaluable, too, as a germicidal hand rinse.

For full information on these and other products in the *complete* Wyandotte line, get in touch with your Wyandotte Representative. He's as near as your telephone.

*Registered trade-mark

WYANDOTTE CHEMICALS CORPORATION
Wyandotte, Mich. • Service Representatives in 88 Cities

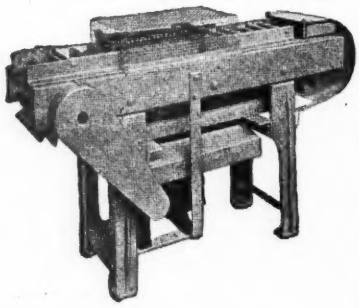
Wyandotte
REG. U. S. PAT. OFF.

# Uniform Relish and Pickle Production Now Possible *With Lower Labor Costs*

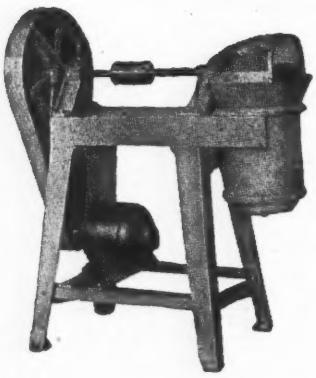
Clean-cut slices or pieces without "feather-edges" or variations in size is possible with CRCO equipment for cross-cut slicing and cutting for pickles, relishes and other products. No costly inspection after cutting. No costly preparation before cutting.

## CRCO-American Cross-Cut Slicer

Delivers high-speed production on cucumbers, beets, mushrooms, celery, okra, etc. Slices are 5/16", 7/32", 9/32" or 3/8". Can easily be changed for slices in any multiple of the above by removing alternate knives when larger pieces are desired. All slices are clean-cut and uniform in thickness.



## CRCO-American Relish Cutter



Cuts food products, such as cucumbers. onions, peppers, tomatoes, beets, carrots, cabbage heads, etc. Always produces uniform, clean-cut pieces. Cutting knives are of the best tool steel with grates of electro tin-plated iron. Size of cut is easily regulated and, once set, will never vary.

## General Purpose Screen

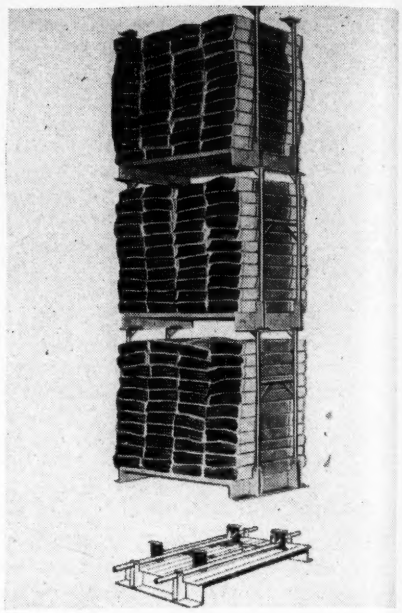
Designed for high capacities with low operation and maintenance costs. Dependable, reliable and economical for removing solids from liquids, for cleaning, de-watering and grading. Available in one, two or three-deck models in stainless steel, aluminum or other non-ferrous metals.

THE BEST OF Everything

**CHISHOLM-RYDER CO. INC.**

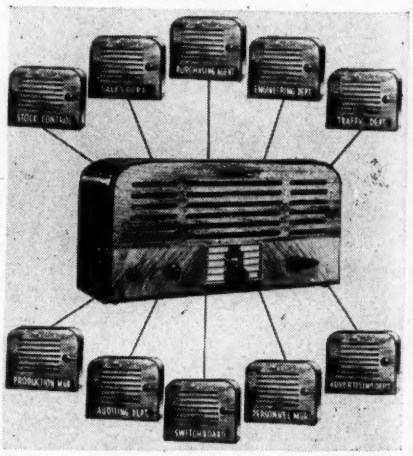
*Niagara Falls, New York*

FOR THE FOOD PROCESSOR

### Multi-Stak Pallets 18

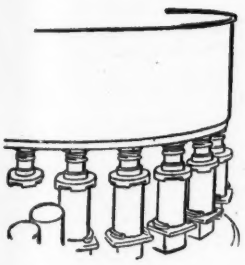
THE Multi-Stak Pallet Stacker Unit, which consists of an all steel pallet and a collapsible self-contained attachment for safe, easy, stacking of crushable or varying sizes of merchandise, is made by Elizabeth Iron Works, Dept. I, Elizabeth 8, N. J. When in use, supporting standards lock in an upright position to hold the pallets, placed one above the other. No weight is placed on the merchandise itself. Loaded pallets may be placed on top of one another as high as the fork lift truck or ceiling will permit. When not in use, the supporting standards fold across the top of the pallet for compact storage in a minimum amount of space. Pallets have a capacity of 4,000 lb. and are manufactured in several sizes, for bulk and heights.



### Inter-Communication 19

THE new Krul-40 "DeLuxe" intercommunication system consisting of one master station, which delivers a maximum of 2½ watts of "Voice Range" power, and one sub-station that may be built up progressively, adding sub-stations as they are needed, is made by Talk-A-Phone Co.,

# A reputation is at stake!

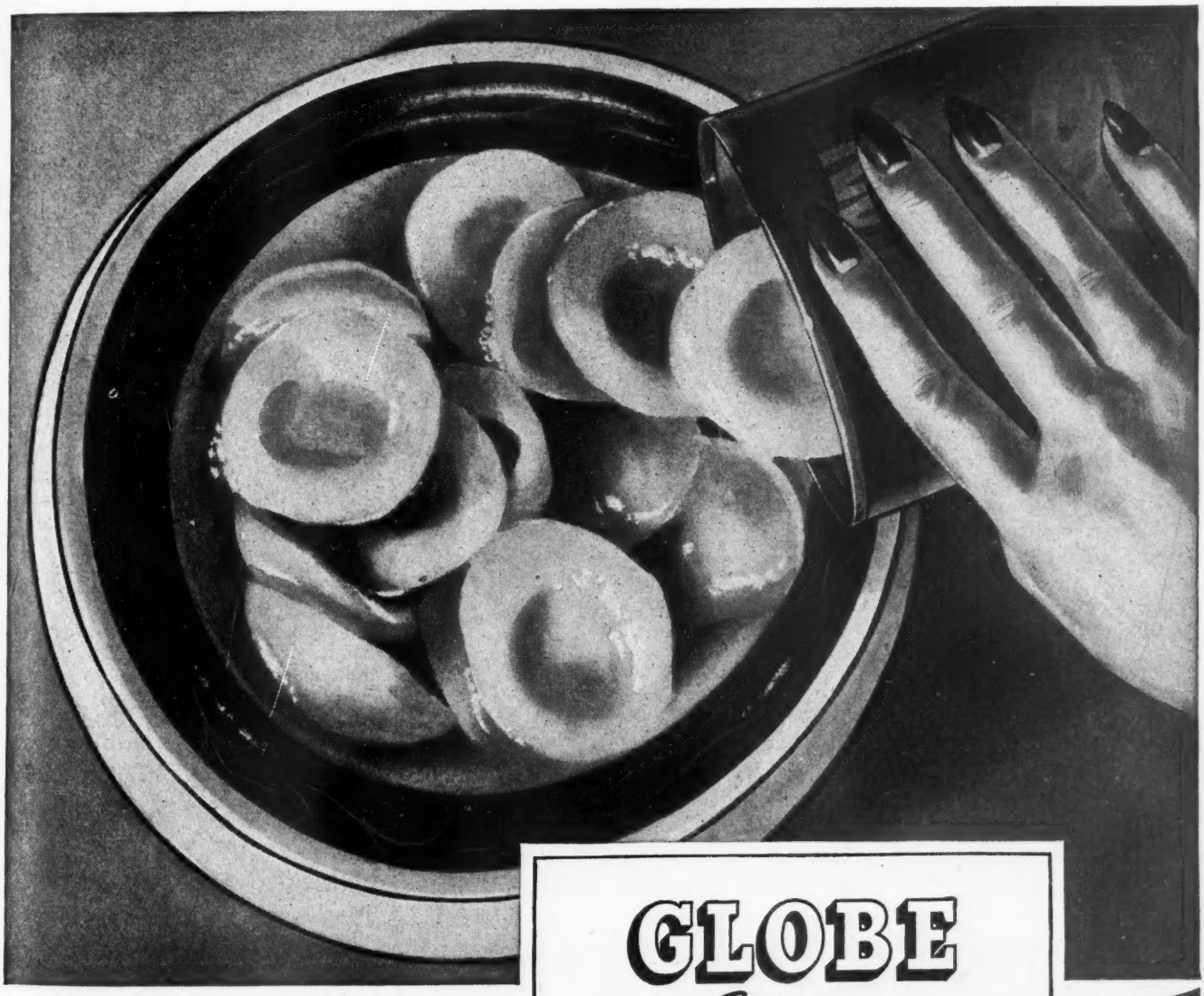


Every time Mrs. American Housewife opens a package of processed food, the reputation of the processor is at stake, for Mrs. Housewife expects the contents to measure up to her confidence in the label. As every food packer knows, reputations are safeguarded best by scrupulous care in the processing of products.

Stainless steel tubes in processing equipment have long been relied on as a first line of defense against unwanted chemical reactions, product contamination and the dangers of corrosion.

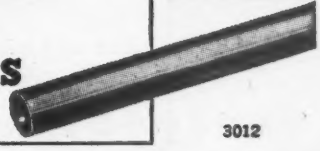
Knowing how to use stainless steel tubes to gain the most in protection calls for specialized "know-how", for just any analysis of stainless steel won't do for all applications. Consult with Globe — as specialists in tubing manufacture and a broad experience record in stainless steel tubing (both seamless and welded) applications we offer valuable technical advisory service to both builder and user of processing equipment.

Globe Steel Tubes Co. • Milwaukee 4, Wisconsin



Write for Bulletin No. 115 and complete information on Globe Seamless Stainless Steel Tubing and Gloweld Welded Stainless Steel Tubing.

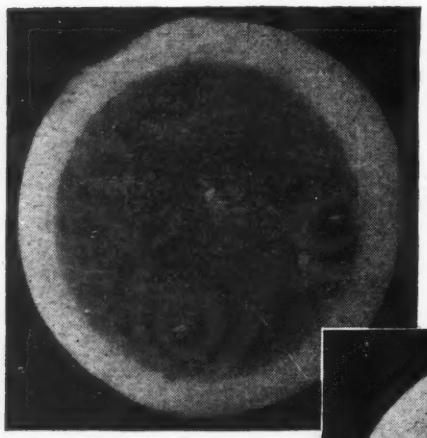
GLOBE
*Stainless*
STEEL TUBES



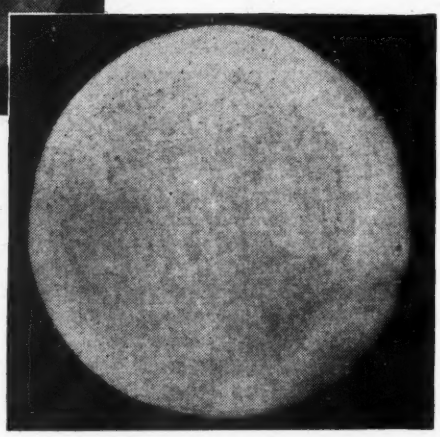
3012

# Sodium Benzoate is a Food Product

**In addition to being U. S. P., Sodium Benzoate produced by Tennessee Products & Chemical Corporation is given the *pure milk sediment test* in order to assure absolute cleanliness and highest purity. *Examine these actual photographs:***



**LEFT — *Sediment from ordinary U. S. P. Sodium Benzoate.***



**RIGHT — *Sediment from Tennessee Products & Chemical Corp., U. S. P. Sodium Benzoate.***

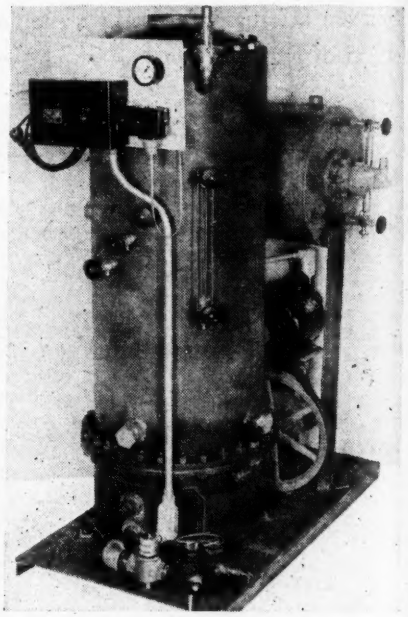
**If you are interesed in high purity along with the best of service, specify *Tennessee Products Sodium Benzoate.* Available in both flake and powdered form.**

**TENNESSEE PRODUCTS & CHEMICAL CORP.**

**General Office: Nashville, Tenn.**

**EASTERN SALES OFFICE: 350 FIFTH AVENUE, NEW YORK, 10, N. Y.**


Dept. I, Chicago 23, Ill. Through the use of his central master station the general manager can communicate in a fraction of a second directly with outlying departments, without going through the switchboard. Individuals can answer though they may be working as far away as 50 ft. from their sub-station. Through the "Silent Feature," the master station picks up none of the noise surrounding the sub-station, yet permits these same sub-stations to originate calls. Master station operates on 110-115 v. either a.c. or d.c. Substations are extremely versatile, consuming no power whatsoever; they may be placed up to 3,000 ft. from the master station.



## Automatic Steam Unit 20

A COMPLETELY automatic gas or oil fired boiler unit that includes a condensate return system, with motor, pump and tank with float valve to add water when needed, is made by Alert Engineering Products, Dept. I, Detroit 26, Mich. Built in several sizes ranging from 2 to 30 hp., the unit also includes water feed control to maintain proper water level in boiler, interconnected piping and wiring. The entire unit is mounted on one substantial steel bedplate base. When set in place, it is only necessary to remove boxing, connect water, steam and fuel, then plug in the extension to a wall socket and the unit is ready to operate.

## Milk Case Weighs 5 Lb. 21

DEVELOPMENT of a new magnesium milk case weighing only 5 lb. is announced by the W. F. Meyers Co., Dept. 1, Bedford, Ind. Designed to handle the new square milk bottles, the new case is of riveted construction and will be available in both open and enclosed types. Greater ease and speed of handling and reduced load demands on delivery equipment

*Automatic signalling that guards the cooking process for Stratford Farm Products of the Theresa Friedman & Sons Company, Philadelphia is accomplished with this Foxboro Instrument panel. Each instrument (Rotax Type) with push buttons and signal lights serves a single kettle. Further details of operations at this new preserving plant furnished on request. (Below: the Foxboro Rotax Recording Controller.)*




# Better Control For Your Food Processing

● ANY ELECTRIC POWER OUTLET plus Foxboro Rotax Control will give you the more-precise regulation of process variables you've been looking for. You can expect improved uniformity in the flavor, consistency and texture of your product . . . less spoilage . . . lower operating costs.

Rotax Control employs the same type of detecting elements found in all other "better-engineered" Foxboro Instruments, but it operates the controlled equipment electrically.

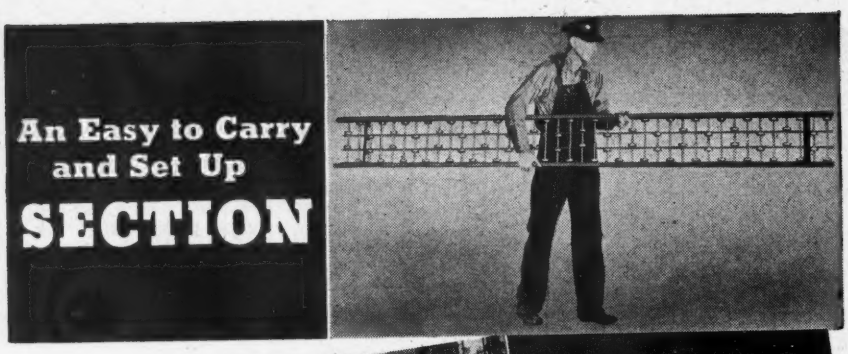
The design of Rotax Instruments makes possible a wide variety of hook-ups including control in combination with signals. Where automatic control is not applicable, an automatic signal system permits easier, more precise and safer manual operation.

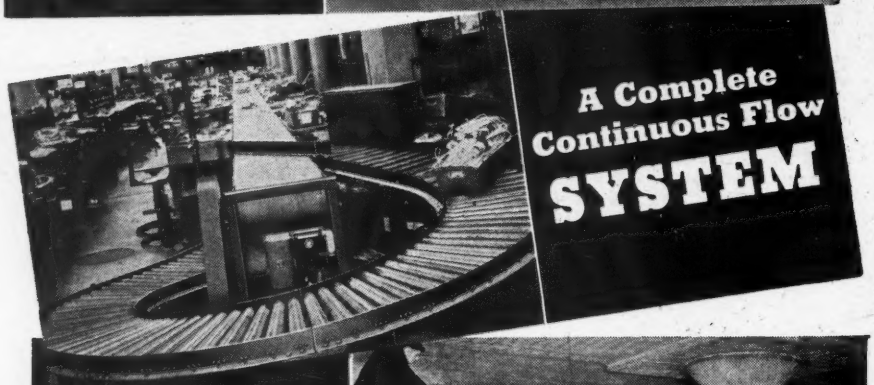
Foxboro makes a complete line of Rotax Controllers . . . indicating and recording models for temperature, pressure, flow, liquid level and other process variables. Hundreds of them are in use in places where electricity is the only source of power or where signals are essential.

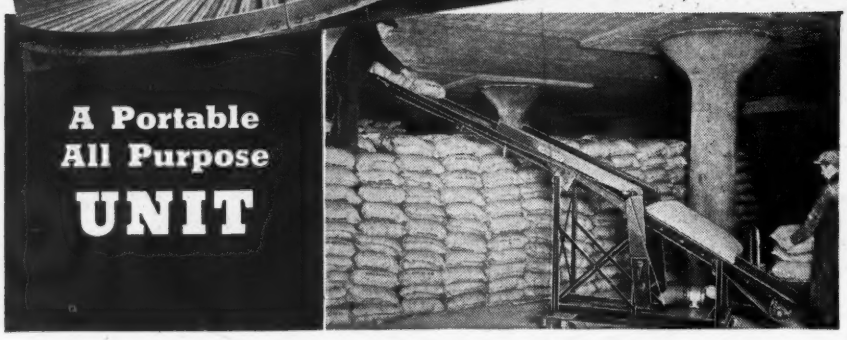
Investigate the improved Rotax Control for your plant processing. Write for Bulletin 184. The Foxboro Company, 30 Neponset Ave., Foxboro, Mass., U.S.A.

FOXBORO
REG. U. S. PAT. OFF.

RECORDING · CONTROLLING · INDICATING
INSTRUMENTS




**Whatever Your Need in Conveying Equipment, Standard *offers* any one or all three**

WHATEVER you have to handle — packages, parts, units,—from receiving of raw material through manufacturing or processing to storage or shipping, Standard equipment can speed operations — save time and cost.

An 8 to 10 ft. section of Standard Wheel Conveyor expedites "spot" handling — a Standard Handibelt or Handipiler portable unit stacks and piles packages easily and quickly to ceiling height or loads and unloads cars and trucks with ease and dispatch — a Standard system of power or gravity conveyors accelerates handling — cuts the cost — at every step in manufacturing.

The range and versatility of Standard Conveyors have been developed in more than 40 years of service to business and industry.

*Write for valuable reference book "Conveyors by Standard" Catalog No. F1-107*

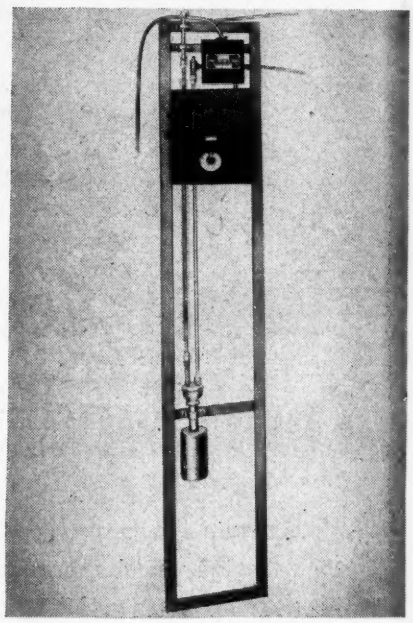
**STANDARD CONVEYOR CO.**
*General Offices:* North St. Paul 9, Minn.
Sales and Service in Principal Cities

ROLLER · BELT · SLAT · PUSHBAR CONVEYORS • PORTABLE CONVEYORS AND PILERS • SPIRAL CHUTES • PNEUMATIC TUBE SYSTEMS


are cited as important advantages of the magnesium case, which is anywhere from 11 to 14 lb. lighter than a wood case after it has absorbed the normal amount of water through washing, steaming and storage. Advantages over the wooden case are: It is far stronger; it will not splinter, break or otherwise deteriorate; it thus has a far greater life expectancy; it is easier to clean and more sanitary. It may be treated with the same cleaning solution used on wood cases.

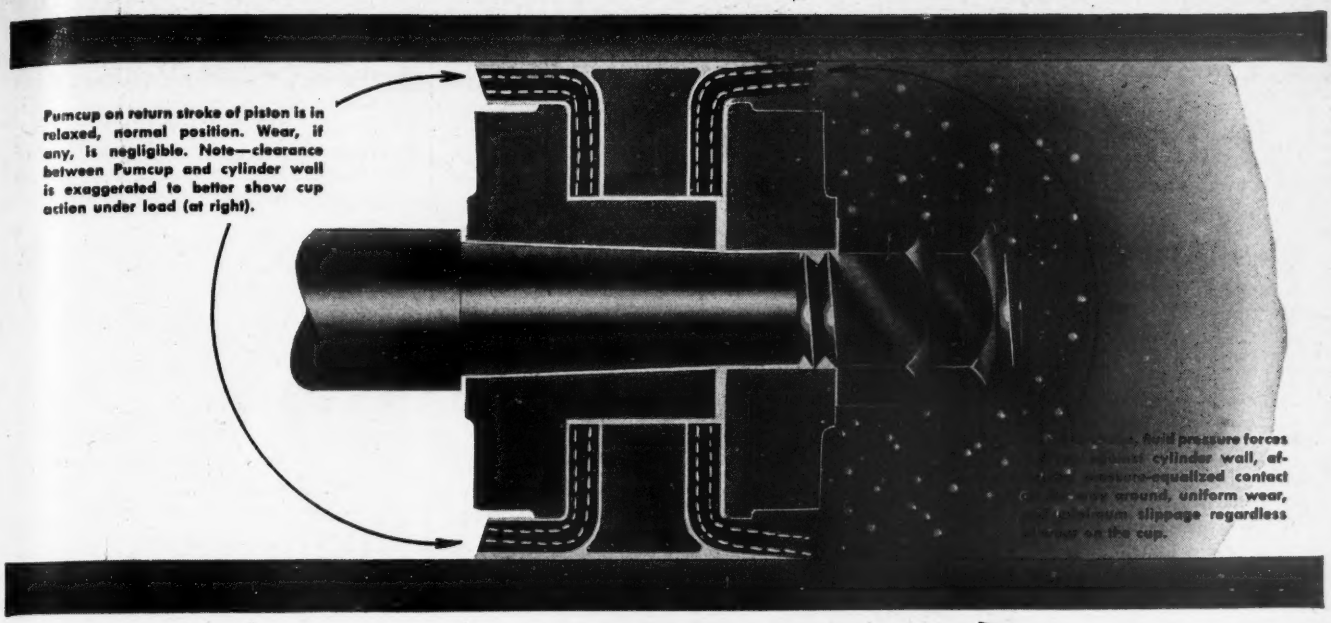
## New Petri Dish 22

A NEW catalog item, No. 3162 Pyrex brand petri dish, is announced by Corning Glass Works, Dept. I, Corning, N. Y. The new dish has an inner bottom held to close flatness tolerances. It is not affected chemically or thermally by any of the methods commonly employed in biological laboratories. A feature is its raised outer edge which provides level 3-point support and prevents the bottom from being scratched.



## 24-Hour Watchman 23

GAS-FIRED processing equipment can now be safeguarded, day and night, throughout idle periods as well as during combustion cycles, by use of the Burns Thermalo Gas Detector, made by Jabez Burns & Sons, Inc., Dept. I, New York 18, N. Y. This instrument detects unburned gas from leaky or carelessly closed valves, or incomplete combustion; indicates on a dial the degree of concentration; and, whenever a pre-determined concentration is reached, automatically operates an alarm or a control to shut off a gas valve in the supply line. Gas detector cells are mounted at convenient points for automatic and continuous sampling of the gases. During normal operation, a green light on the control box shows constantly; but whenever un-


Pumcup on return stroke of piston is in relaxed, normal position. Wear, if any, is negligible. Note—clearance between Pumcup and cylinder wall is exaggerated to better show cup action under load (at right).
PUMP PISTON MOTION

# NEW RETIREMENT PLAN . . .

## *for piston packing*

WHAT is the "retirement age" of the piston packing in your reciprocating pumps, or in your air or hydraulic controls? A day? A week? A month?

Think what you could save in maintenance expense, in costly shutdowns, with a packing that does a perfect job 5, 10, or even 100 times as long. That's exactly what Darcova Pumcups are doing in thousands of installations where they have replaced leather crimps, ring packing, metal or plastic rings, or other ordinary packing.

How? First, the drawing above shows how the cup principle, scientifically applied the Darcova way, minimizes friction, equalizes and retards wear. Second, Pumcups are made of a special, Darcova-developed composition, exceptionally wear-resistant and immune to tough pressure and temperature conditions. Third, Pumcups are precision-built in many different textures, each absolutely uniform. Fourth, despite wear, high volumetric efficiency is retained for the life of the packing.

So, if you're not using Darcova Pumcups, you're in line for a new piston packing "retirement plan"—one that will save you plenty of time, trouble and expense. For a free bulletin containing complete information, write, or use the coupon below.

*Darcova Pumcups are made in standard sizes from ½ to 42 inches in diameter, are easily installed in any reciprocating pump or air or hydraulic mechanism to replace ordinary packing. They handle virtually any fluid under a wide range of pressure and temperature conditions.*

DARCOVA
THE ORIGINAL COMPOSITION CUP

**DARLING VALVE & Manufacturing Co.**
WILLIAMSPORT, PA.

Darling Valve & Mfg. Co., Williamsport 61, Pa.
Please send me the free bulletin checked below:
☐ No. 4401 Darcova Pumcups for reciprocating pumps.
☐ No. 4502 Darcova Pumcups for air or hydraulic mechanisms.

Name_____
Company_____
Address_____
City_____ State_____

# FABLE OF THE RAT

## who didn't know his BISCUITS!

You're gazing at a picture of Mr. Rat enjoying his last banquet. It *looked* good, *smelled* good, *tasted* good, but what this predatory prowler didn't know about RODITE was—*to eat it, is to die.*

RODITE, you see, contains a special scent and flavor to entice rats—and a special extract of poison to kill them in an *entirely different way. Through paralysis of their respiratory system!*

The wonderful thing about RODITE is that not only will this ready-prepared cereal cracker lure rodents to their death more surely than ordinary rat poisons—but that it seldom leaves a trace of their foul carcasses on your premises to cause annoying odors and costly "rip-ups".

RODITE is relatively harmless to humans and other animals. Consult one of over 475 West Representatives, specially trained to solve your rodent problems.

*Products That Promote Sanitation*

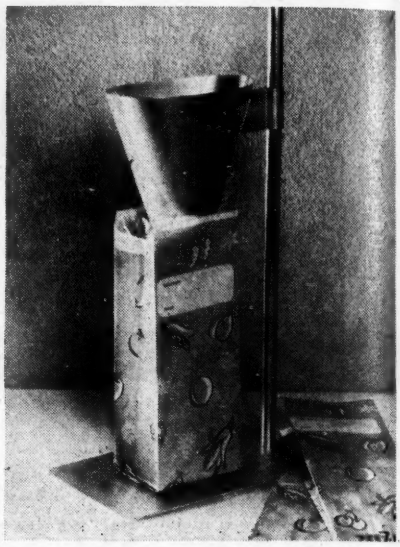
WEST DISINFECTING Company

42-16 WEST STREET
LONG ISLAND CITY 1, N. Y.

★ BRANCHES IN PRINCIPAL CITIES OF THE UNITED STATES AND CANADA

CLEANSING DISINFECTANTS • INSECTICIDES • KOTEX VENDING MACHINES
PAPER TOWELS • AUTOMATIC DEODORIZING APPLIANCES • LIQUID SOAPS

burned gas reaches a predetermined concentration, a red light gives a permanent signal (and an automatic gas shut-off valve may operate as well), until the affected area is purged. Failure of current or of any part of the mechanism operates the alarm (or a gas shut-off) automatically.



### Frozen Food Bag Filler 24

A HANDY frozen food bag filler, especially designed for easy loading of locker and home freezer bags, is manufactured by the Suburban Machine Co. of Chicago, and is distributed by Shellmar Products Corp., Dept. I, Mt. Vernon, Ohio. Made of light-weight, non-rust aluminum, this sturdy filler is easily adjusted to fill any size bag. It provides ample area in which to pour foods and is easily cleaned.

### Air Conditioner 25

AN improved air conditioner that operates on the principle of saturating air with moisture at a given desired dewpoint temperature and then, by re-heating, producing the exact condition of relative humidity and temperature needed in a laboratory, manufacturing or process space, or for impingement on a product, as in many continuous drying operations, is announced by the Niagara Blower Co., Dept. I, New York 17, N. Y. New designs of cooling and heating coils and spray arrangement for great turbulence achieve saturation of air in an exceedingly small floor space. The apparatus occupies 7½ sq. ft. and delivers 2,000 cu. ft. of air per min. Other models requiring up to 50 sq. ft. give air delivery up to 20,000 cu. ft. per min. Casing is of stainless steel welded into an integral unit for the utmost dependability of service under conditions inviting corrosion. Controls provide for holding or varying at will the conditions of relative humidity and temperature between 40 and 125 deg. F. dewpoint temperature with extremely close tolerance.

# CATALOGS, BULLETINS

**This digest of manufacturers' new publications is offered by FOOD INDUSTRIES Reader Service as a convenience for executives. The editors feature catalogs, data sheets and technical pamphlets likely to interest purchasing agents, superintendents, packaging men and food technologists.**

## Food Plant Equipment

**Labelers** ..... 51
Norton Co.—4-page bulletin on The Duplex Oslund Automatic Labeler. Contains illustrations and description. Also 4-page bulletin on The Single Oslund Automatic Labeler which contains 4 application photographs, descriptions and list of users.

**Engineered Pipe Coils** ..... 52
Frick Co.—Bulletin 156-C, "There's More Satisfaction in Using Frick Engineered Pipe Coils for Refrigeration Work." contains application photographs and arrangement diagrams. Also bulletin 203-F, "Frick Electric Control Valves," contains illustrations, tables and ordering directions.

**Insect Control** ..... 53
Entoleter Div., The Safety Car Heating & Lighting Co., Inc.—Pamphlet describing the Entoleter system of continuous insect control in use in hundreds of flour mills and food plants. Contains installation illustrations, line drawings and specification data.

**Water Conditioning** ..... 54
Allis-Chalmers Mfg. Co.—12-page bulletin 28B6611 explaining the essential functions of a hot process water conditioning system.

**Plug Valves** ..... 55
American Car & Foundry Co.—8-page illustrated pamphlet describing the complete line of A.C.F. lubricated plug valves.

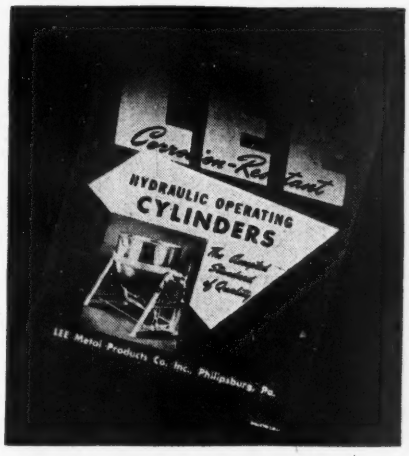
**Fluorescent Lighting** ..... 56
Bright Light Reflector Co., Inc., 2, 4-page bulletins on "Silv-A-King" fluorescent lighting units for modern industry. Bulletin 46 FS on Silv-A-King RLM contains specifications and lighting data. Bulletin No. 447 FV on "The Vanguard" and "Vangloe," new commercial units.

**Blowers—Exhausters** ..... 57
Lamson Corp., Allen Billmyre Div.—20-page illustrated booklet B-5, "Blowers, Exhausters, Centrifugal Type." Contains descriptions and rating tables of the full line of blowers and exhausters made by this company. Also ordering and technical data, conversion table and applications.

**Gear Pumps** ..... 58
Sier-Bath Gear & Pump Co.—New catalog illustrates and describes this company's Gearex rotary pumps. Features of the pumps are illustrated and described, and a number of applications are discussed in detail.

**Stainless Steel** ..... 59
Rise and importance of the meat industry and its use of stainless steels is portrayed in the latest "Industry Booklet," published by Allegheny-Ludlum Steel Corp. Uses of Allegheny stainless steels in slaughter houses, sausage manufacture, meat processing and canning, lard and oleomargarine making and retail sales, are described. Tables list corrosion resistance and comparative physical properties.

**Hydraulic Cylinders** ..... 60
Lee Metal Products Co., Inc.—4-page bulletin on Lee hydraulic operating cylinders, designed for operating tilting kettles or agitators where the ever-




changing center of gravity threatens loss of product, damaged equipment or injury to the operator. Operating on city water pressure, a single valve insures smooth action.

**Magnet Separators** ..... 61
Bauer Bros., Co.—4-page bulletin M-3 illustrates and describes Triple-Air-Gap and Single-Air-Gap magnetic separators for spouts and chutes; portable magnetic separators for conveyor belts and picking tables.

**Powder Filling Machinery** ..... 62
Harold W. Baker Co.—New catalog detailing a complete line of powder-filling machinery. Included are automatic, semi-automatic and manual fillers for the food, chemical, pharmaceutical and allied industries. Contains photos, performance data and complete specifications for all equipment.

**Air Filters** ..... 63
The application of replaceable type air filters for ventilating and air-conditioning systems is explained in an 8-page booklet issued by American Air Filter Co. Descriptions and illustrations of each type filter are given, along with instructions for maintenance and detailed engineering and installation data.

**De Watering Pumps** ..... 64
Peerless Pump Division of the Food Machinery Corp.—New 24-page bulletin, No. B-148, describing a mixed flow-type pump which can be applied to numerous dewatering, flood control, agricultural and industrial services. The Peerless hydro-foil pump line, which includes a propeller type pump is also described.

**Aluminum** ..... 65
Reynolds Metal Co.—32-page booklet describing the use of aluminum in heating, ventilating and air conditioning.

**Centralized Lubrication** ..... 66
The Farval Corp.—6-page bulletin, "Studies in Centralized Lubrication," gives a few representative case histories of Farval centralized lubricating installations on mills, machines, cranes and conveyors.

**Level Indicators** ..... 67
Yarnall-Waring Co. — New 16-page bulletin WG-1822 on remote liquid level indicators. Contains new material on the compensator and the control unit and its attachment. Gives installation details, complete with line drawings, for remote water level indicator and for control unit and remote signals. Illustrated with typical installation photographs.

**Pumps** ..... 68
Jabsco Pump Co.—Bulletin No. 346 describes Jabsco gearless, instant self-priming bronze pumps with oil resistant rubber impellers for pumping animal, vegetable and mineral oils, in capacities ranging from 1.8 to 34.0 gpm.

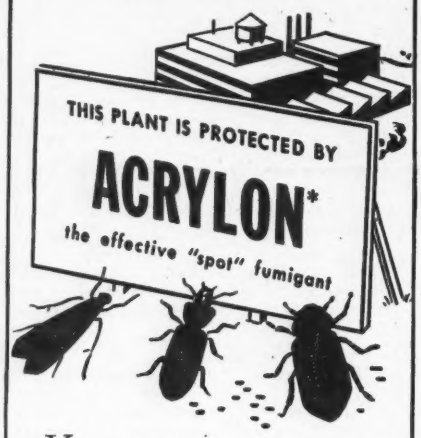
**Coding Machines** ..... 69
Adolph Gottscho, Inc.—New brochure describing 22 different industrial marking and coding machines made by this company. Illustrations of each machine in operation are accompanied by explanatory information about their applications and uses, while a handy tipped-on index identifies the machines according to the articles they are designed to mark or imprint.

**Rubber Belts** ..... 70
A new 12-page catalog section No. 2150 on "Selection and Maintenance of Rubber Transmission Belts" has just been issued by The B. F. Goodrich Co. It lists commonly used sizes and minimum pulley diameters for its various grades of belting and their horsepower capacity. Includes: Table of service factors of prime movers; rules for determ-

## HOW TO GET THIS LITERATURE

**Food Industries Reader Service now supplies tear-out coupon cards for your convenience in requesting copies of these new publications from manufacturers. Use one or more of the cards on the colored sheet bound near this page. Fill out, tear out, mail out and the Reader Service staff will see that your requests reach the manufacturers.**

# ALL INSECTS BEWARE!




Your plant can be kept insect-free by regular applications of ACRYLON, the "spot" fumigant especially developed for direct application to food-processing and handling machines. For ACRYLON is ideal for use in bakeries, flour mills and similar food-processing plants.

Highly toxic to all insects, ACRYLON vaporizes completely and is non-flammable. It leaves no residue and does not adversely affect food products in any way.

ACRYLON is economical, too. Fluid-ounce graduations on the quart-size bottle assure accurate measuring, no waste. Also available in 10-gallon and 50-gallon drums.

*Write for detailed information*

*Reg. U. S. Pat. Off.

**LIQUID HCN** for general, building-wide fumigation, and ACRYLON, periodically applied in strategic spots, work hand in hand to provide thorough, constant control of insect and rodent pests in your plant. Complete information on request.

**American Cyanamid Company**
*Agricultural Chemicals Division*
30-X Rockefeller Plaza • N. Y. 20, N. Y.

***Keep your plant insect-free at all times with LIQUID HCN and ACRYLON***


ining the horsepower; formula for finding the arc of contact; length of open drive and crossed endless belts; correct lengths to cut belts, and belt speeds.

**Filter Screens** ..... 71
Ferguson Perforating & Wire Co.—4-page folder, "Centrifugal Screens With or Without Interlocking Joints," contains photographs of wire cloth 2-400 mesh) and perforated metals for centrifugal screens.

**Wheat Washer** ..... 72
The Wolf Co.—10-page bulletin on the new wheat washers and driers made by this company. Profusely illustrated with photographs, cut-away views and line drawings. Contains operating instructions, tables of capacities, dimensions and weights. Also illustrates and describes variable speed drives and stone separators.

## Materials Handling

**Gravity Conveyors** ..... 73
The Rapids-Standard Co., Inc.—New 2-color, 24-page gravity conveyor catalog containing descriptions, photographs and specifications of the company's entire line of gravity conveyors. It groups together the Rapid-Wheel and Rapid-Roller gravity conveyors and includes a complete listing of all accessories.

**Conveyor Belts** ..... 74
"Cyclone Metal Conveyor Belt" is the title of catalog No. 3 by Cyclone Fence Div. of U. S. Steel Corp. This 23-page bulletin contains many food plant application photographs, as well as illustrations, descriptions and specifications of the many types of metal conveyor belts made by this company.

**Fork-Lift Truck** ..... 75
Clark Equipment Co.—16-page booklet describes the versatility of its 1,000-lb. fork-lift truck. Illustrated by action photographs showing the Trucloader at work in several manufacturing plants, the booklet presents 14 tabloid descriptions of the assignments.

**Saving in Shipping** ..... 76
Acme Steel Co.—New 32-page booklet containing authentic, illustrated case histories of savings in time, materials and labor, through the use of Acme Steel strapping methods. Actual cost figures are given. Also contains photos of the latest models of all Acme tools and accessories plus information on the location of division and sales offices.

## Plant Supplies

**Acid Type Detergent** ..... 77
An effective means of removing oxidized residues, burnt-on food deposits, stains and discolorations on aluminum, copper and stainless steel equipment surfaces, is described in a feature article, "Tough Cleaning Job? An Acid-Type Detergent Is Often the Answer," appearing in a recent issue of Oakite Products, Inc., bi-monthly house publication.

**Gaskets** ..... 78
Armstrong Cork Co.—20-page booklet containing numerous tables and graphs giving the properties of the various cork, cork and synthetic rubber and synthetic rubber gasket materials. Includes recommendations for selection of sealing materials.

**Filter Media** ..... 79
T. Shriver & Co.—Bulletin No. 123 on Shriver Filter Media. Describes with


# How COOK-CHEX prevents UNCOOKED MATERIAL

**Cook-Chex Tags tell you "It's cooked" by a complete color change from purple to green.**

COOK-CHEX Retort Tags make it impossible for baskets or whole retort loads to be by-passed for labeling, packing, shipping or storing *unless the contents have been* completely cooked. Cook-Chex eliminates cooking errors, stops spoilage and waste, saves time and materials, safeguards customer goodwill and profits.

**COOK-CHEX TAGS are simple and accurate in use:**

1. Place a tag on *each* basket before cooking.
2. Look at each tag *before* unloading.
3. If it's purple, food is *not* cooked.
4. If green, food *is* cooked, ready for labels.
5. File tags bearing batch and retort numbers as permanent records.

● *$9.75 per thousand — less than 1/50¢ per case*

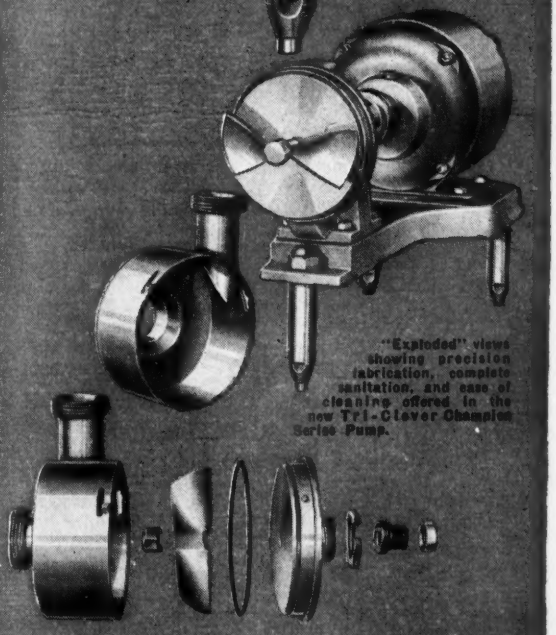
**THIS METAL CONTAINER is a practical, sturdy holder for Cook-Chex tags. Write for FREE sample holder and tags, with complete facts and directions.**

ATI COOK-CHEX
COOK CHEX
MANUFACTURED BY
ASEPTIC-THERMO INDICATOR CO.
4665 HOLLYWOOD BLVD. - LOS ANGELES 27

# Now-for the first time

## . . . a centrifugal pump that actually exceeds present sanitary code requirements!

## the NEW TRI-CLOVER Champion



"Exploded" views showing precision fabrication, complete sanitation, and ease of cleaning offered in the new Tri-Clover Champion Series Pump.

| CHAMPION PUMP CAPACITIES | |
|---|---|
| MODEL MS | 0.0 G.P.M. @ 15.5 ft. head<br>66 G.P.M. @ 0.0 ft. head |
| MODEL S | 0.0 G.P.M. @ 25.0 ft. head<br>95 G.P.M. @ 0.0 ft. head |

***Offering all these exclusive features:***

★ COMPLETELY DEMOUNTABLE HEAD ★ PATENTED CARBON-FACED NEOPRENE SEALS ★ ALUMINUM ALLOY RUST-RESISTANT BASE AND BRACKET ★ STAINLESS STEEL LEGS . . . FRONT LEG ADJUSTABLE ★ ALL CONTACT PARTS ARE POLISHED 18-8 STAINLESS STEEL ★ GREATER EFFICIENCY AT THE SAME LOW PRICE AS PREVIOUS MODELS.

***Made to PERFECTION for your PROTECTION***

**Tri-Clover MACHINE CO.**
Kenosha, Wisconsin

TRIALLOY AND STAINLESS STEEL SANITARY FITTINGS, VALVES, PUMPS, TUBING, SPECIALTIES

FABRICATED STAINLESS STEEL INDUSTRIAL FITTINGS AND INDUSTRIAL PUMPS

THE Complete LINE

*See your Tri-Clover Jobber for complete details*

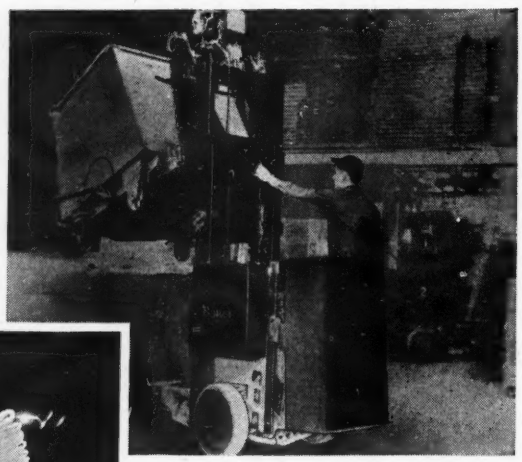
# BAKER TRUCK

## delivers 35 hours' work in 3!

**At the Erie, Pa. plant of a large paper manufacturer it formerly took seven men five hours to unload, weigh and store a box-car load of pulp. Today a Baker Truck with one operator can do the job in 3 hours!**

This Erie plant has a fleet of 24 storage-battery powered industrial trucks in daily operation—with several more on order. Annual production is well over 100,000,000 lbs. of paper, comprising almost 3,000 different kinds, sizes and colors. Trucks are used for unloading and storing incoming raw materials, transporting materials in process, warehousing finished products, and for loading orders for shipment into box-cars. "In all cases" the company states, "sizeable savings were made, not only in handling cost, but also the jobs in which the trucks were used were made many times easier."

Material Handling operations at this plant are controlled by a central department, which integrates all operations and enables the company to utilize its equipment to the best advantage. Where possible, materials are handled in unit loads on pallets or skids. Plans are under way to have all suppliers ship materials on pallets—incoming shipments not now on pallets are palletized at the receiving point. A new warehouse just completed was designed around mechanized unit-load handling with electric-powered trucks and tractor-trailers. The results are a maximum use of warehouse space, a minimum of handling time and cost, and better, faster service for the company's customers.



*Substantial savings were made by using a Baker Hy-Lift Truck with special tilt-type platform for charging heaters with pulp.*

*Baker Fork Truck picking up unit load of lap pulp for loading into box-car.*

*Let the Baker Material Handling Engineer show you how similar savings are possible in your plant.*

**BAKER INDUSTRIAL TRUCK DIVISION**
*of The Baker-Raulang Company*
2146 West 25th Street • Cleveland, Ohio
*In Canada:*
*Railway and Power Engineering Corporation, Limited*

*Members*
*Electric Industrial Truck Association*

**Baker INDUSTRIAL TRUCKS**


illustrations the complete line of media for filter plates, leaves, discs and bags made by the company.

**Labels** ..... 80

Avery Adhesive Label Corp.—2-color folder describes the advantages of Kum-Kleen self-adhesive labels in speeding production, for carrying instructions, warnings, diagrams, specifications and sales features.

**Resazurin Tablets** ..... 81

National Aniline Div., Allied Chemical & Dye Corp.—Technical leaflet on the use of Resazurin tablets for faster dye-reduction tests in milk-quality control.

## Control Equipment

**Humidity Control** ..... 82

Surface Combustion Corp.—Colorful 8-page booklet explaining the principle of operation and details of application of the Kathabar system of selective humidity control for industrial processing applications.

**Canning Controls** ..... 83

C. J. Tagliabue Div., Portable Products Corp.—18-page catalog "Tag Instruments for the Canning Industry." Contains installation diagrams, photographs and specifications of the various Tag automatic controls used in the canning industry.

**Pressure Indicator** ..... 84

The Barton Instrument Co.—8-page bulletin 181-1 describing the new Model 181 differential pressure indicator for the accurate measurement of flow, liquid level and pressure differentials.

## Miscellaneous

**Retreading Aprons** ..... 85

Columbus Glove Mfg. Co.—"Retread Old Aprons," a circular explaining a new process for making worn industrial aprons as good as new at approximately 50 percent the cost of new ones.

**Glycols** ..... 86

The Dow Chemical Co.—56-page illustrated brochure, "Dow Glycols," presents in detail the uses, chemistry and physical properties of ethylene, diethylene, triethylene, propylene and dipropylene glycols. Contains many tables, curves and a complete index.

**Roof Repairs** ..... 87

Roof maintenance for the plant handy-man is discussed in a newly-published folder, "Is Your Roof a Fair-Weather Friend," by Stonhard Co. It points out that extra years of service can be gotten from any type of roof and explains how to stop leaks, renew dried-out roof surfaces, repair flashings and gutters.

**Laboratory Equipment** ..... 88

Aetna Scientific Co.—Bulletin S contains general descriptions and operating instructions for the various types of Aetna water stills for hospitals, laboratories and industry. Details of construction are shown. Bulletin D is a 10-page booklet illustrating and describing laboratory type sterilizers and autoclaves.

**Cleaning** ..... 89

Cleaning in the Packing Industry, a new, compact pamphlet by the Philadelphia Quartz Co., gives complete information on cleaning operations. It contains data on Metso detergents along with a handy "How to Use" chart. Protection of equipment during cleaning is also discussed.

# FOOD TECHNOLOGY
## NEW DISCOVERIES AND INVENTIONS

## DEHYDRATION

### Dehydration of Foods

IMMERSING food for a relatively short time in organic hydrophilic material is the novel first step in a patented process for dehydrating foods. Removal of water from the food and impregnation with a strongly hydrophilic material take place at practically the same time, the absorbed hydrophilic material aiding appreciably in rehydrating the food to a state closely approximating its condition before drying. The drying process is completed by an evaporation stage carried out in an oven or vacuum drying apparatus. Examples of suitable hydrophilic materials are glycerol, sorbitol, glucose, corn sirup, sucrose and cane molasses. The invention is especially applicable to foods in which it is desired to retain the original cell structure in the rehydrated product.

Digest from U. S. Patent 2,420,517, issued May 13, 1947, on an application dated May 7, 1943, to John D. Brandner, Wilmington, and Rudolph Max Goepp, Jr., New Castle, Del., and assigned to Atlas Powder Co., Wilmington, Del.

## CANNING

### Spores in Canned Meats

CANNED meat products accumulate numerous types of organisms and their spores by the time the cans are ready for thermal processing. As there is no evidence of growth of these organisms over periods up to 18 months there apparently is some inhibition of germination.

As part of a program of study on the thermal processing of meat, the resistance of spores normally present was determined by sampling cans from production lines just before they underwent heat treatment. After opening the cans aseptically, one g. samples were sealed in glass tubes and processed in a thermostatically controlled oil bath. Ten tubes each were processed at 214.2 deg. F. at levels of 421, 1,341, 3,795 and 6,249 sec., respectively.

Pork luncheon meat in 12 oz. 2½- and 6-lb. cans, chopped ham in 6- and 8-lb. cans, and bulk pork sausage in 24- and 34-oz. cans were sampled. None of the tubes incubated for 9 to 18 months at 75-80 deg. F. showed any visual sign of spoilage, though viable spores could still be demonstrated in many of them.

The absence of visual evidence of growth at all processing levels indicates inhibition of spore germination. Salt concentration has been suggested as the factor responsible for this, but data are too inadequate for a final conclusion.

Digest from "Bacteriological Studies Relating to Thermal Processing of Canned Meats, VIII. Thermal Resistance of Spores Normally Present in Meats," by C. Vinton, S. Martin Jr., and C. E. Gross, *Food Research*, vol. 12, 184-187, May-June, 1947.

## FATS and OILS

### Vaccenic Acid in Fats

BUTTER fat in their ration stimulates the growth of rats more rapidly than when rape-seed oil is used. The addition of vaccenic acid to the latter diet at a level of 0.1 percent of the total ration causes the rate of growth to approximate that of the rats fed butter fat. From this it is concluded that vaccenic acid is one of the constituents of butter fat responsible for its higher nutritive value as compared with vegetable oils. Analysis of a group of fats and oils showed presence of vaccenic acid in butter fat, lard, mutton fat, margarine, and beef fat, but none in corn oil, cottonseed oil, soy bean oil, or coconut oil.

Digest from "The Vaccenic Acid Content of Various Fats and Oils," by R. P. Geyer, H. Nath, V. H. Barki, C. A. Elvehjem and E. B. Hart, *The Journal of Biological Chemistry*, 169, June, 1947.

## BAKING

### Dry Milk in Bread

NON-FAT dry milk solids having over 2.2 mg. of whey protein are judged of poor baking quality. There are borderline cases, however, as the distinction between good and poor baking quality cannot be sharply differentiated.

Based on the methods used by Harland and Ashworth for studying whey proteins in milk, a turbidometric method of determining the whey proteins in non-fat dry milk solids has been devised that is an indication of the probable behavior of the dry milk in bread doughs. The method depends on the measurement in an Evelyn colorimeter of the light transmission with a 420 millimicron filter of a solution of the dry milk treated first with saturated NaCl and then with HCl. By reference to a calibration curve constructed from fresh skim milk the whey protein of the dry sample is determined.

The method was successful in predicting the baking quality of 29 out of 35 samples. It is relatively simple, accurate and rapid, and well adapted to routine determinations.

Digest from "A Rapid Method for Estimation of Whey Proteins as an Indication of Baking Quality of Nonfat Dry-Milk Solids," by H. A. Harland and U. S. Ashworth, *Food Research*, vol. 12, 247-251, May-June, 1947.

### Treating Malt Sprouts

REMOVAL of lipoidal material, and other substances injurious to bread quality, from malt sprouts without destroying the glutathione content of the sprouts, is the basis of a re-

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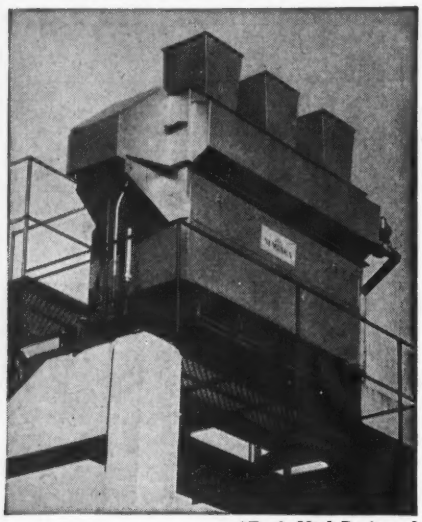

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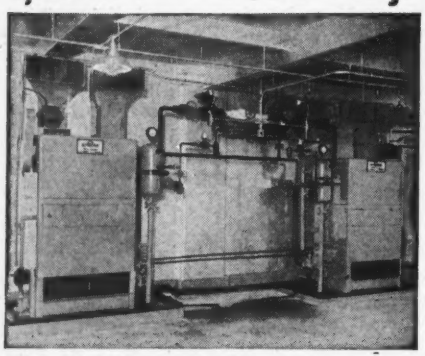

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cently patented process. Sprouts are first separated from the hulls of the malt berry by screening, after which the sprouts are ground preparatory to extraction with a solvent-like petroleum ether. Two extractions are made with the ether, using 15 times the weight of the sprouts and allowing contact of 15 minutes. The mixture is filtered or centrifuged, and the residue heated to evaporate the traces of ether, but at a temperature low enough to prevent destruction of glutathione. Barley sprouts thus treated usually contain four to five mg. glutathione per gram and may be mixed with bread dough in quantities to supply 10 to 60 parts of glutathione per million parts of flour.

Digest from U. S. Patent 2,420,567, issued May 13, 1947, on an application dated February 22, 1943, to Roland W. Selman, Jr., Kansas City, Kan., and Homer S. Myers, Kansas City, Mo., and assigned to Campbell-Taggart Research Corp., Kansas City, Mo.

# MICROBIOLOGY

## Bacterial Disruption By Sonic Energy

IN the course of experiments to evaluate the effects produced by treating bacteria with intense sound, one of the most noticeable results was an increase in the apparent transparency of a suspension of organisms with the time of treatment. Consequently a method was developed for the turbidimetric evaluation of bacterial disruption by sonic energy. The method seems to be one by which a base line of comparison between various vibrating devices can be established. It is sensitive to comparatively small changes in the device which supplies the sonic energy, the quantity of liquid, or time of treatment. It is independent of the instrument used for measuring turbidity, because findings are reported in terms of absorption coefficients multiplied by a constant.

Digest from "Turbidimetric Evaluation of Bacterial Disruption by Sonic Energy," by R. F. Shropshire, *Journal of Bacteriology*, vol. 53, no. 6, 685-693, June, 1947.

## Citric Acid Production

*Aspergillus wentii*, isolated from the soil, is capable of producing citric acid under submerged conditions of growth with complete absence of oxalic acid. In addition to the strain of organism, composition of the culture medium and supply of oxygen are the most important controlling factors.

(*Continued on page* 182)


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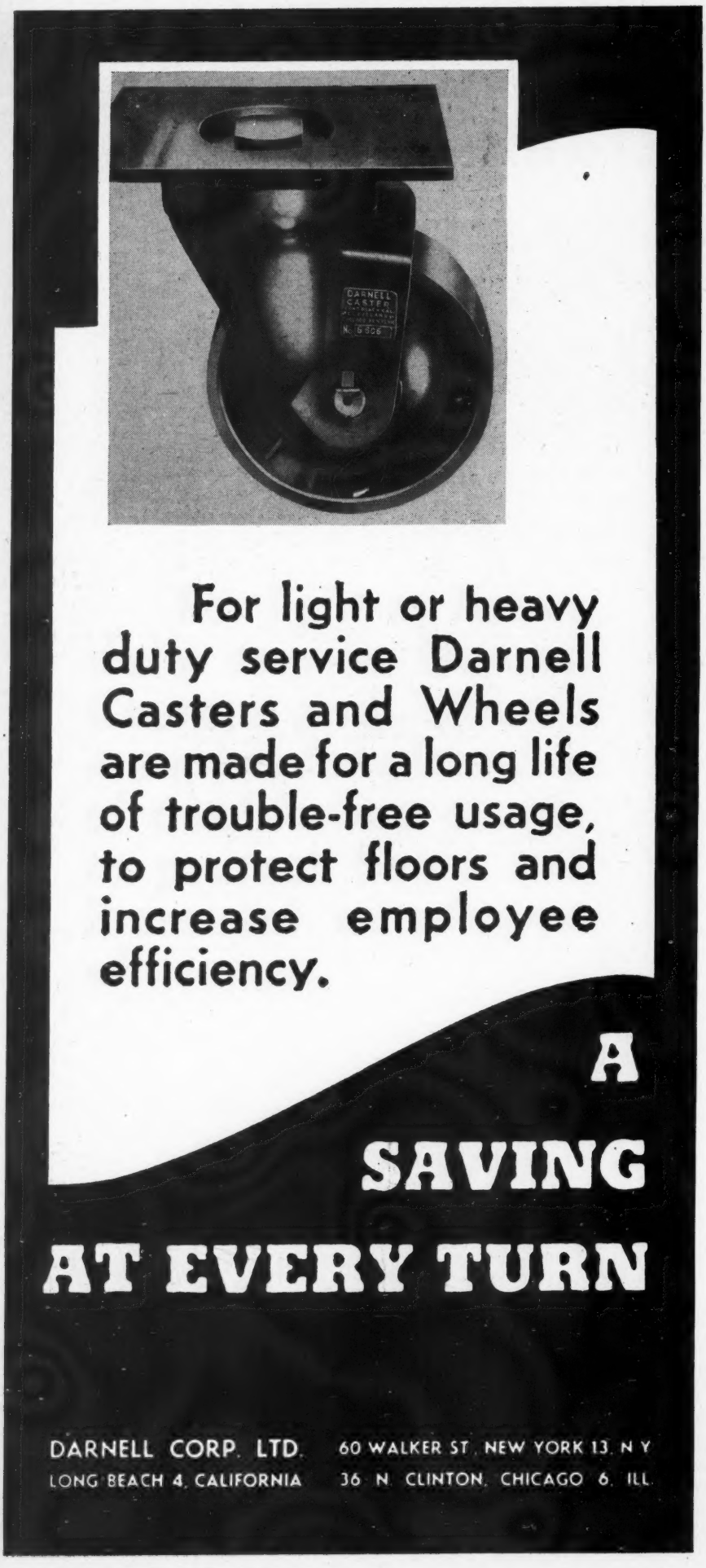
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The supply of nitrogen and phosphate appear to be fixed at rather definite concentrations. Zinc and manganese salts are also necessary for optimum production. To maintain the high concentration of oxygen required, its use either as oxygen gas or air under pressure is suggested.

Sucrose gives the highest conversion, but production of citric acid from molasses appears to be possible when many of the inorganic impurities are removed. Use of ion exchange resins for this purification is suggested.

Digest from "Production of Citric Acid in Submerged Culture," by E. O. Karow and S. A. Waksman, *Industrial and Engineering Chemistry*, vol. 39, 821-825, July, 1947.

## DAIRY

### Quality of Sweetened Condensed

VISCOSITY is a good indication of quality in sweetened condensed milk. Factors affecting viscosity are: (1) Quality of raw milk; acidity of 0.03 to 0.04 percent above normal fresh value is detrimental, (2) forewarming treatment; the temperature must be at least 180 deg. F., (3) sweetening; sucrose alone may be used, dextrose accelerates thickening, (4) evaporation process; overheating must be avoided, especially near the end of the process; (5) prompt cooling, with sufficient time for lactose crystallization, (6) bulk packaging in new, clean paraffin-coated barrels, (7) storage; viscosity increases in proportion to increase in storage temperature and logarithmically with time.

Digest from "Observations on the Viscosity of Sweetened Condensed Milk," by B. H. Webb, an address delivered before the American Bulk Condensed Milk Assn., April 23, 1947.

### Slow Cheese Cultures

OUTBREAKS of slow acid production in cheese manufacture, definitely established as due to bacteriophage, are of relatively recent origin in the United States. During such an outbreak in the cheese-making laboratories of Iowa State College an attempt was made to control the difficulty by the use of cultures that were not sensitive to the bacteriophage types responsible for the outbreak. Five cultures selected for the study developed sensitivity to bacteriophage after being used in making cheese for one or two days. One culture isolated from

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sour cream produced acid rapidly in cheese manufacture for about three months before it developed sensitivity to bacteriophage. Another, also isolated from sour cream, produced acid satisfactorily for more than six months, and was not sensitive to bacteriophage at the end of that period. Multiple-strain cultures also may fail to produce acid. Four types of bacteriophage were recovered from whey taken from a vat in which a multiple-strain culture was used and in which acid production had ceased. Ten bacteriophage types which are active against one or more of 15 cultures of *S. lactis*, isolated from a multiple-strain cheese culture, were isolated from various plants having difficulty with slow acid production.

Digest from "Studies on the Susceptibility of Certain Cheese Cultures to the Action of Bacteriophage," by F. J. Babel, *Journal of Dairy Science*, vol. 30, no. 7, 507-516, July, 1947.

## FRUIT PRODUCTS

### Concentrating Fruit Juice by Freezing

THIS process has been applied to juices obtained as byproducts from the preparation of purees from Michigan black raspberries, sour cherries, tomatoes, plums and grapes. Successful concentrates were made from all except tomatoes. Three successive concentrations were made from the same batch of grape juice. Scorers preferred diluted grape concentrates over the original juice, the highest concentrate receiving the best score. The plum beverage was considered good, but the cherry juice was too tart and the black raspberry too flat. Grape and plum concentrates, sweetened, were judged to be excellent sundae sauces.

Digest from "Concentration of Fruit Juice by Freezing," by Pauline Paul, Michigan Agricultural Experiment Station, *Quarterly Bulletin*, May, 1947.

## FERMENTATION

### Fermented Juice Product

OBJECTIVE of a recently patented process is the production of a fermented juice product which has the aroma or bouquet of the natural juice from which the product is made. Steps in the process comprise: (1) Expressing the juice from the fruit, (2) distilling the aromatics from the juice and collecting them in a condensate comprising from one to five percent of

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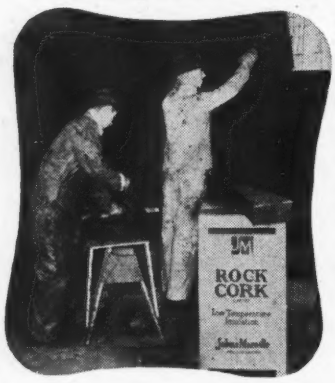


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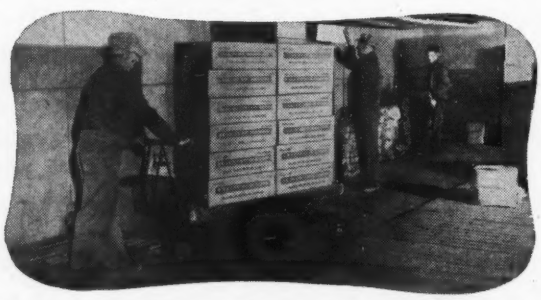

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the volume of the unfermented juice, (3) fermenting the juice remaining after the aromatics have been distilled, and (4) recombining the aromatics with the fermented juice after fermentation has ceased. The process is applicable to cider vinegar, wines or champagnes and brandy.

Digest from U. S. Patent 2,419,286, issued April 22, 1947, on an application dated December 4, 1944, to William A. Rooker, Winchester, Va., and assigned to National Fruit Products Co., Inc., Winchester, Va.

## QUALITY CONTROL

### Pasteurization Test

ANNOUNCEMENT is made by the Bureau of Dairy Industry, U. S. Department of Agriculture, of the development of a phosphatase test applicable to practically all dairy products to determine whether the milk used in making those products has been pasteurized. Thus far the test has been successfully applied to fluid milk and cream, cheeses and cheese spreads, milk drinks, ice cream mixes and sherbets. The test is expected to serve as a public health safeguard against undulant fever or brucellosis. With the improved test it is possible to detect a decrease of as little as one deg. F. in the pasteurizing temperature, and the presence of one pound of raw milk in 2,000 lb. of properly pasteurized milk.

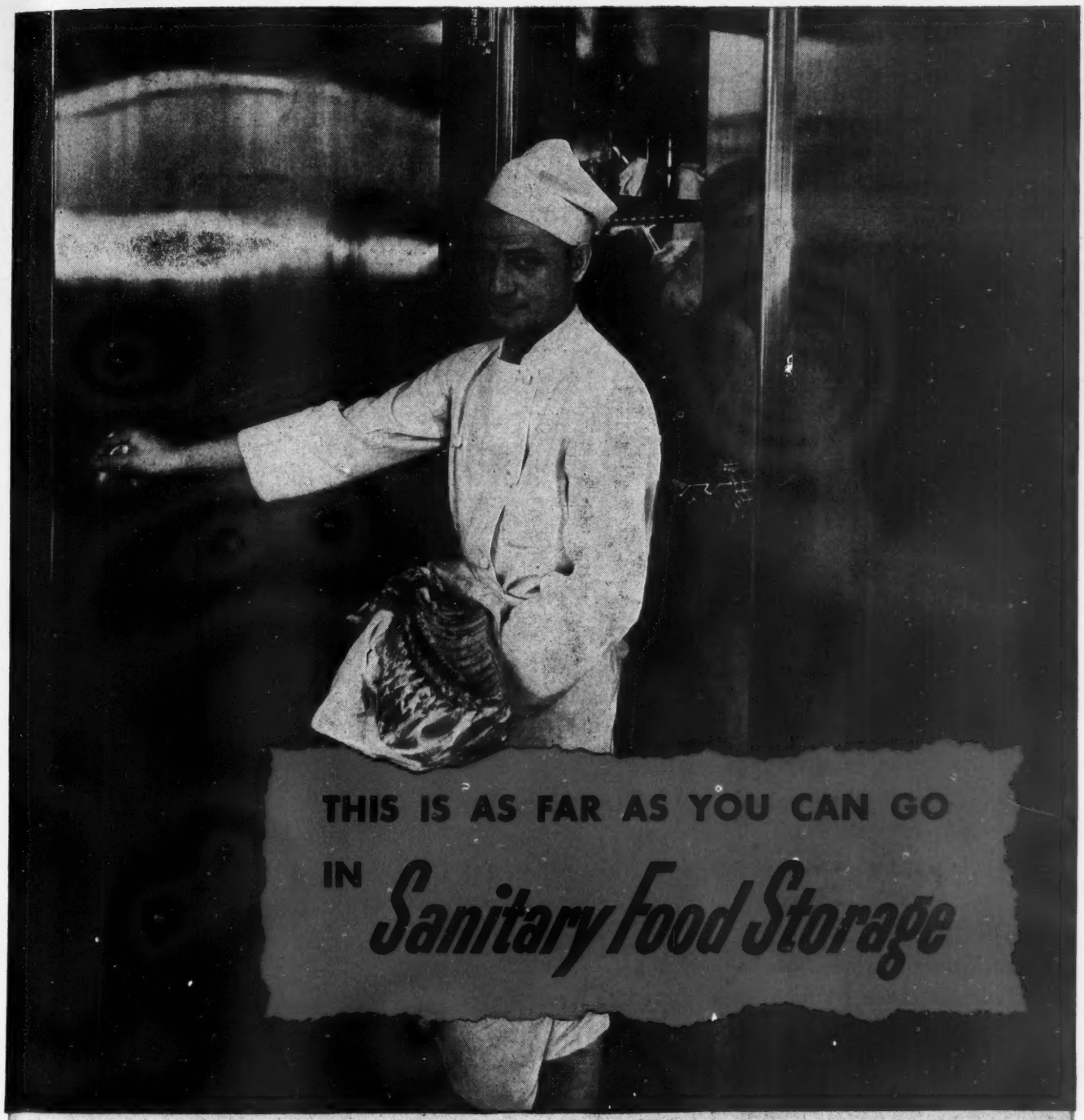
Digest from "Pasteurization Test Can Now Be Applied to Almost All Dairy Products," a release August 6, 1947, of the U. S. Department of Agriculture, Washington, D. C.

### Pectin Determination

PECTIN is normally determined by hydrolysis to pectic acid and precipitation of the insoluble calcium salt. Because it can be characterized by the carboxyl groups it contains, a reasonable criterion of purity is its approach to a 100 percent calcium pectate value, and the approach of the carboxyl groups, both free and esterified, to 20.5 percent of the calcium pectate values.

Apple pectins, when dialyzed against water, increased to a maximum of 70 percent calcium pectate when precipitated by alcohol. Dialysis removed sugars, acids and inorganic matter. Ash was reduced to a minimum of 2.4 percent of the calcium pectate value, the minimum probably representing inorganic ions combined with some of the unesterified carboxyl groups.

Since the calcium pectate value never reached more than 75 percent

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in any of the experiments, the nature of the remaining 25 percent remains to be determined. It is known to be reduced more by precipitation with alcohol than by dialysis, and its effect on gel formation is being investigated.

In none of the experiments did the total carboxyl groups reach 20.5 percent of the calcium pectate value. A range of 16.2 to 20.2 percent indicates satisfactory purity. Copper reducing power of pectin has little value as a measure of the degree of purification.

Digest from "Pectin Studies, Part I. Method of Purification," by L. H. Lampitt, R. W. Money, B. E. Judge and A. Urie, *Journal of the Society of Chemical Industry*, vol. 66, 121-124, April, 1947.

### $SO_2$ in Fruit Juices

IN concentrated fruit juices, especially if they have been overheated, substances other than sulphites and ascorbic acid are oxidized by iodine. For this reason iodine titration, after fixation of sulphites by acetone, does not always measure ascorbic acid content of such juices. There is also an error due to dilution of concentrated sulphite juices but it is usually not serious if titration follows immediately. The titration with iodine itself tends to liberate $SO_2$ rapidly enough to be troublesome in accurate work.

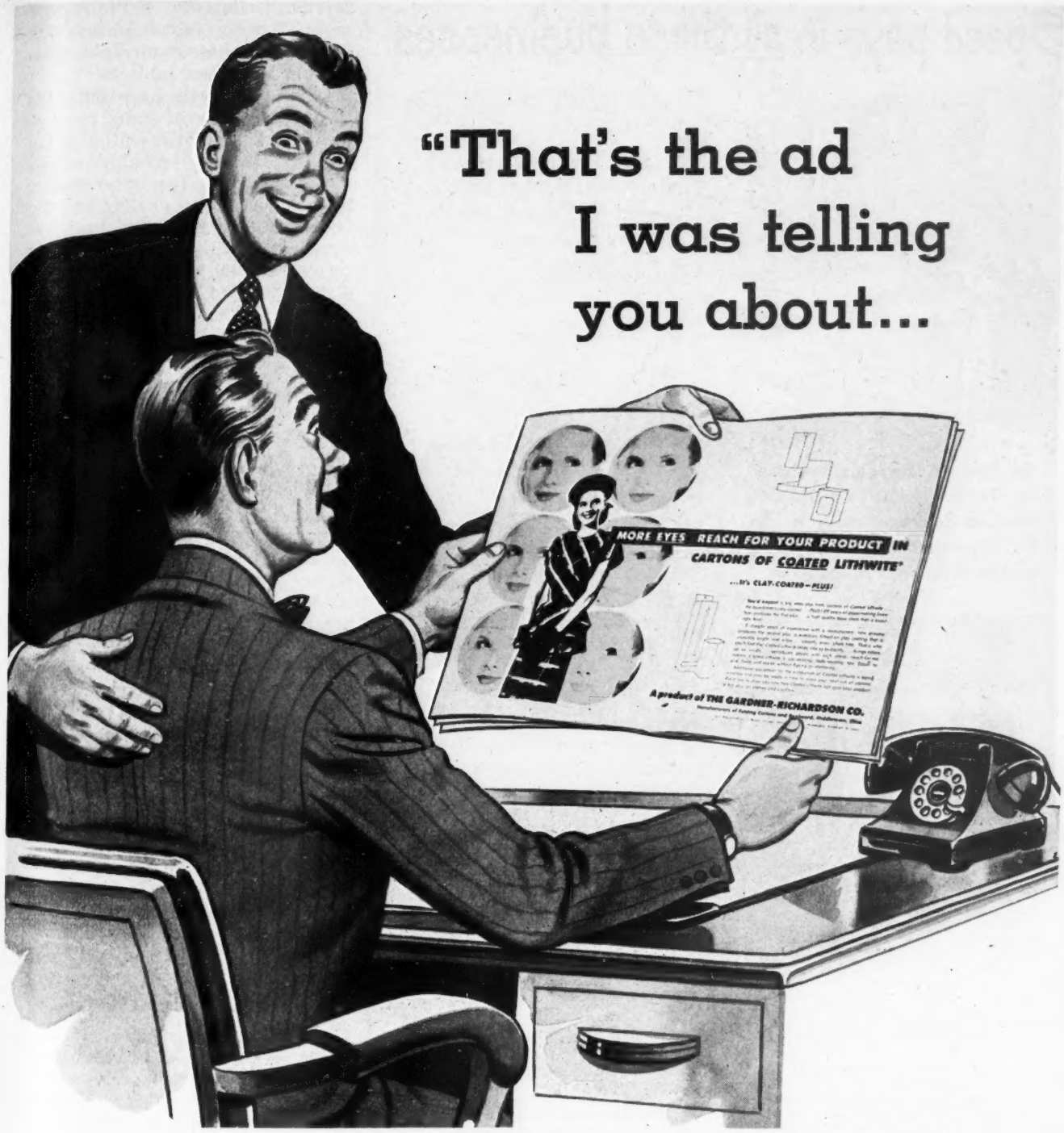
Addition of 20 percent acetone removes only 85 percent of the free $SO_2$ in 10 min. More acetone (up to 50 percent) does not increase the $SO_2$ removed, but increasing the time to 30 min. resulted in 95 percent removal.

Digest from "Investigation of Errors Arising in Iodometric Determination of Free Sulphurous Acid by the Acetone Procedure," by M. Ingram, *Journal of the Society of Chemical Industry*, vol. 66, 105-115, April, 1947.

## MISCELLANEOUS

### Role of Amino Acids

AMINO acids are body builders, evidenced by the fact that animals deprived of them fail to grow. Investigations in the biochemical laboratories of the University of Illinois have shown that mixtures of certain amino acids are satisfactory substitutes for dietary protein for human beings as well as for rats. Essential in human diet are the following eight amino acids: valine, methionine, threonine, leucine, isoleucine, phenylalanine, tryptophane, and lysine. The exclusion of each from the diet of experimental human subjects upset the nitrogen equilibrium, and caused loss of appetite, fatigue and

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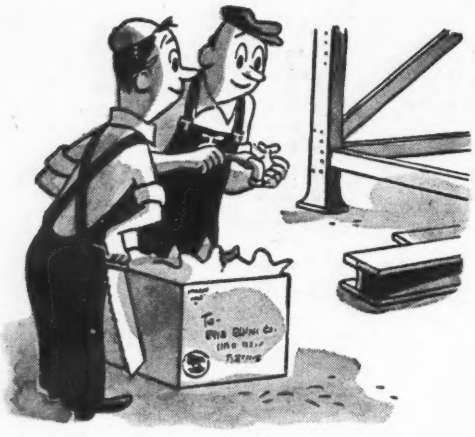

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nervous irritability. Histidine and arginine were found unnecessary for maintenance of nitrogen equilibrium in human subjects.

Qualitative tests have indicated the upper limits of daily requirements of the eight essential amino acids, but they probably exceed actual minima. The latter cannot be announced with finality, but the tryptophane requirement has been established with enough certainty to warrant the tentative figure of 0.15 g. per day for maintenance of nitrogen equilibrium. Measurements of other amino acids are progressing satisfactorily.

Digest from "The Nutritive Role of the Amino Acids," by W. C. Rose, *The Science of Nutrition*, 46-51, papers presented at meetings of The Nutrition Foundation, November 13-14, 1946.

## Refining Glutamic Acid

REMOVAL of impurities from crude d-glutamic acid and production of an alkali salt of high yield and purity are the features of a recently patented process. The crude acid is treated with a strong oxidizing agent that parts freely with its combined oxygen. The resulting slurry is centrifuged, and the crystal mass is treated with an alkali, activated carbon and a filter aid. After the reaction is complete the batch is filtered. The filtrate is evaporated, preferably in vacuo, and crystallized. The crystals of the mono-basic salt are then centrifuged and dried.

Digest from U. S. Patent 2,419,256, issued April 22, 1947, on an application dated November 25, 1943, to Herman W. Dorn, Toledo, O., and assigned to International Minerals & Chemical Corporation of New York.

## Persistence of DDT

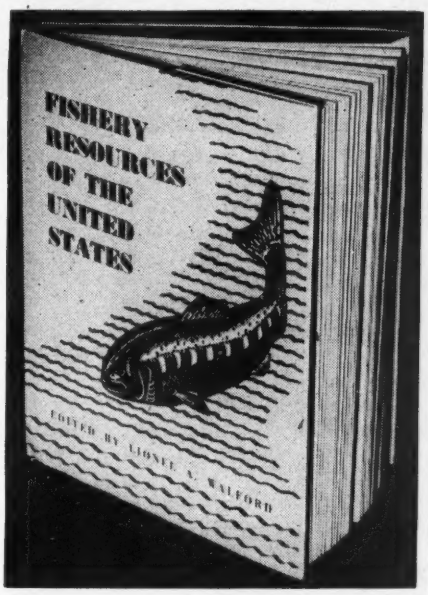
ALTHOUGH DDT is known to be a valuable insecticide for control of cattle pests, field tests have shown that it does not have the lasting effect on living animal surfaces that it has on non-living surfaces. Investigation of the possible reasons for this loss of effectiveness has led to the conclusion that the major cause for the removal of DDT from the hair of cattle is licking, either by the animal concerned or by another. Other factors play a minor role, of which rubbing, solar radiation, and the leaching action of rain seem most important. The results also suggest that adequate control of ticks, etc., as distinct from eradication, can be obtained with sprays containing less than one percent of DDT.

Digest from "The Persistence of DDT on Cattle," by R. H. Hackman, *Journal of the Council for Scientific and Industrial Research*, vol. 20, no. 1, February, 1947.

# BOOKS

## U. S. Fisheries

FISHERY RESOURCES OF THE UNITED STATES. Edited by Lionel A. Walford. Published by Public Affairs Press, 2153 Florida Ave., Washington 8, D. C., 1947. 134 pages; 9½x12¼ in.; cloth. Price, $5.




Graphically illustrated and with a minimum of text, this book brings together the essence of the major investigations on fishery resources in the U. S., made by the Fish and Wildlife Service. It offers a wealth of up-to-date information taken from technical studies and papers gathered by the service. Not only are the kind and extent of our fishery resources revealed, but the book also tells what is known about them and what remains to be learned.

The editor is the chief of Atlantic fishery investigations of the Fish and Wildlife Service and has had the collaboration of various members of the service staff in preparing the book.

## Gum Data

THE WATER SOLUBLE GUMS. By C. L. Mantell. Published by Reinhold Publishing Co., 330 W. 42nd St., New York 18, N. Y., 1947. 279 pages; 6¼ x 9¼ in.; cloth. Price, $6.

Coordination of the scattered information of gums is a recognized need. In this volume the attempt is made to bring together what is known of the water soluble gums.

The gums discussed are limited to the tree exudations, of which arabic, ghatti, karaya, and tragacanth are examples; such seaweed colloids as agar, Irish moss, carrageenin, and the alginates; the seed extracts of which locust bean, locust kernel and quince seed gums are typical; the manufactured dextrins and British gums, and the water dispersible derivatives of cellulose. As gelatin has many gum uses, it is also discussed.

## Sugar Browning

THE COLOR PROBLEM IN SUCROSE MANUFACTURE. By F. W. Zerban. Published by Sugar Research Foundation, Inc., 52 Wall St., New York 5, N. Y., 1947. 31 pages; 6 x 9 in.; paper. Free.

In food processing, browning is sometimes desirable as in the case of baked goods, dry cereals, boiled meats, etc. More often, however, it is to be avoided, or at least minimized. As any food chemist knows, the tendency toward browning is ever present in processing sugar and in the innumerable processed foods where sugar is used.

This booklet, the second of the Sugar Research Foundation's technological series, discusses these color substances in sugars. It offers methods for minimizing their formation, as well as their removal. The data should be of interest, not only to sugar refiners, but to all users of sugar and sugar products.

## Flour Infestation

THE CONTROL OF INSECTS IN FLOUR MILLS. By J. A. Freeman and E. E. Turtle. Published by His Majesty's Stationery Office. Distributed by British Information Services, 30 Rockefeller Plaza, New York 20, N. Y., 1947. 84 pages; 7 x 9¼ in.; paper. Price, $2.35.

While control of infestation is highly developed in American flour mills, this treatise offers some aspects that may occasionally be overlooked. It covers every aspect of flour mill infestation from treatment of materials through prevention and remedy. A large section is devoted to life histories and habits of many of the insects and mites encountered in flour processing.

The authors are respectively chief chemist and chief entomologist of the infestation control division of the British Ministry of Food. They have had full access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to the data on the subject built up by the British scientific service. In all of its discussion of infestation, the book remains on a practical economic level.

## GOVERNMENT PUBLICATIONS

The following recently issued documents are available, at the prices indicated, from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. When no price is indicated the pamphlet is free and should be ordered from the bureau responsible for its issue.

FISHERY STATISTICS OF THE UNITED STATES, 1943. By A. W. Anderson and E. A. Power. Fish and Wildlife Service, Statistical Digest No. 14. Price 75 cents.

THE ROLE OF STARCH IN BREAD STALING. A review and annotated bibliography of the scientific and technological literature. By W. F. Geddes and C. W. Bice. Issued as Quartermaster Corps Report QMC 17-10. Order from Quartermaster Food and Container Institute, 1849 West Pershing Road, Chicago 9, Illinois.

COOPERATIVE FROZEN-FOOD LOCKER PLANTS ORGANIZATION AND OPERATION. By S. T. Warrington and Paul C. Wilkins. U. S. Department of Agriculture, Circular C-127. Price 25 cents.

LIST OF COMMERCIAL STANDARDS, revised to April 1, 1947. National Bureau of Standards, Letter Circular LC853. Mimeographed.

SUPPLEMENT TO NATIONAL DIRECTORY OF COMMODITY SPECIFICATIONS. National Bureau of Standards, Supplement to Miscellaneous Publication M178. Price $2.25. Cloth.

PRODUCTION OF MANUFACTURED DAIRY PRODUCTS, 1946 (Preliminary). Bureau of Agricultural Economics. July 1947. Unnumbered, processed.

RECOMMENDATIONS ON MECHANICAL CONDITIONING OF SOFT OR HIGH-MOISTURE CORN FROM THE CORN CONDITIONING CONFERENCE, July 21, 1947. Agricultural Research Administration. Unnumbered, mimeographed.

THE UTILIZATION OF WHEY. By B. H. Webb and E. O. Whittier. Bureau of Dairy Industry, BDIM-Inf-49. Processed.

PEANUTS IN SOUTHERN AGRICULTURE. By K. L. Bachman, et al. Bureau of Agricultural Economics, FM 65. Processed.

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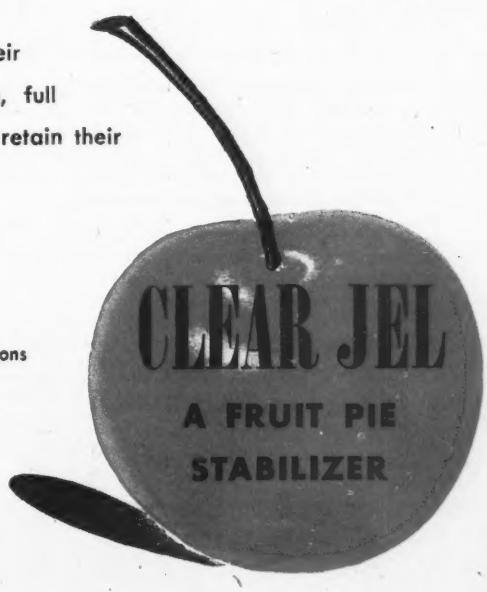


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## CHEMICAL COMMENTS

### Dow Glycols Enter The Electrical Field

The five Dow Industrial Glycols, products of many-sided importance to a variety of industries, have extended their usefulness in the past few years into the electrical field. Modern small dry electrolytic radio condensers are made possible by virtue of the fact that glycols will dissolve appreciable quantities of boric acid. Diethylene Glycol is used successfully for this purpose, as it rates high as a nonvolatile conductor that does not corrode aluminum.

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The action of bacteria in the hydraulic systems of metal fabricating plants causes frequent shutdowns and costly hydraulic fluid replacements. This trouble can be eliminated by the use of as little as one part Dowicide A per one thousand parts of the soluble oil-water hydraulic fluid. This application of the Dowicides has been used with excellent results with other systems employing soluble oils.

### Methocel Keeps Pigments Stable in Paints

Methocel (Dow Methylcellulose) is proving useful in many ways in the paint industry and especially to manufacturers of water-base paints. It keeps pigments from flooding, settling or caking, provides thickening and binding action, and also serves as a pigment disperser. Its protective colloid action insures emulsion stability. In addition, its controlled viscosity prevents undue penetration and assures excellent brushing characteristics.

Further information on any of these chemical developments is available on request.

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# PATENTS

**Density of Fruit Cake Increased by Subjection to Pressure After Baking Is Complete and While Cake Is Still Fresh and Pliable to Reduce Normal Volume From 10 to 40 Percent**—William H. Brooks, San Francisco, Calif. No. 2,421,112. May 27, 1947.

**Protein Hydrate Formed by Subjecting Peanut Protein and Soya Protein to Water Suspension Having pH of About 7.0**—Raymond S. Burnett and Earl J. Roberts, New Orleans, La., to United States of America. No. 2,421,113. May 27, 1947.

**Recovery of Purified Antioxidant Nordihydroguaiaretic Acid, From Crude Extract Solutions by Use of Selective Organic Solvent and Fractional Crystallization**—Ole Gisvold to University of Minnesota, Minneapolis, Minn. Nos. 2,421,117 and 2,421,118. May 27, 1947.

**Natural Flavor of Food Retained During Dehydration by Using Desiccant Saturated With Volatile Flavoring Constituents Natural to Foods Being Dehydrated**—Arie J. Haagen-Smit to California Institute Research Foundation, Pasadena, Calif. No. 2,421,121. May 27, 1947.

**Crystalline Riboflavin Obtained by Treating Amorphous Reddish-Brown Reduction Product of Riboflavin With Polar Solvent**—Julian K. Dale to Commercial Solvents Corp., Terre Haute, Ind. No. 2,421,142. May 27, 1947.

**Granular Free Flowing Salt Made Substantially Dustless by Coating Particles With Film of Water-Soluble Adhesive**—Rock L. Comstock, Weeks, La., to Bay Chemical Co., Inc., New Orleans, La. No. 2,421,185. May 27, 1947.

**Eggs Preserved by Coagulating Layer of White Between Central Core and Exterior Wall of Container, Filling Central Core With Raw Egg Yolk, Coagulating Egg Yolk, Sterilizing and Sealing Container**—Hanns A. Gutmann, Vineland, N. J. No. 2,421,199. May 27, 1947.

**Shredded Type Ready-to-Eat Breakfast Cereal Made to Consist of 85 to 60 Percent by Weight of Defatted Soya Particles and From 15 to 40 Percent by Weight of Other Cereal Grain Particles**—William P. Penty to Kellogg Co., Battle Creek, Mich. No. 2,421,216. May 27, 1947.

**Intimately Associated and Toasted Ready-to-Eat Breakfast Cereal Made to Consist of 20 to 30 Percent Defatted Soya Particles and From 70 to 80 Percent by Weight of Yellow Corn Particles**—William F. Penty to Kellogg Co., Battle Creek, Mich. No. 2,421,217. May 27, 1947.

**Sweetening Syrup Made From Fruits**—Arvid M. Erickson, San Jose, and John D. Ryan, Campbell, Calif., to Barron-Gray Packing Co., San Jose, Calif. No. 2,421,376. June 3, 1947.

**Crystalline Sugar Bleached by Chlorite of Non-Toxic Metal Possessing Bactericidal Properties**—Horace S. Isbell to United States of America. No. 2,421,-380. June 3, 1947.

**Figs Individually Humidified While Passing Continuously Through Zone of Water Bath Heated to Less Than 212 Deg. F. Without Contact With Liquid Water or Live Steam** — William F. Elliott, Merced, Calif. No. 2,421,489. June 3, 1947.

**Water-Dispersible Multivitamin Composition Made to Consist of Ethyl Alcohol, at Least One Fat-Soluble Vitamin, Riboflavin, Water-Soluble Vitamin Other Than Riboflavin, Glycerin and Lactic Acid**—Loran O. Buxton, East Orange and Sol Tobias Lipsius, Orange, N. J., to Nopco Chemical Co. No. 2,421,-598. June 3, 1947.

**Animal and Vegetable Oils Deaerated and Deodorized While Flowing Continuously Counter Current to Steam**—Dion K. Dean, Rahway, N. J., to Foster Wheeler Corp., New York, N. Y. No. 2,422,185. June 17, 1947.

**Freshly Drained Blood from Slaughtered Animals Collected and Mixed with Anti-Coagulant Preparatory to Further Treatment**—Bertie S. Harrington to Armour & Co., Chicago, Ill. No. 2,422,194. June 17, 1947.

**Vitamin $B_{12}$ Synthesized**—Stanton A. Harris, Westfield, N. J., to Merck & Co., Inc., Rahway, N. J. Nos. 2,422,195; 2,422,616; 2,422,617; 2,422,618; 2,422,619; 2,422,620; 2,422,621 and 2,422,622. June 17, 1947.

**Fish Units Mechanically Filled Into Cans from Protective Storage Supply Tunnel**—John P. Jakob, Roselle, N. J., to American Can Co., New York, N. Y. No. 2,422,198. June 17, 1947.

**Glycerine Recovered from Concentrated Still Residue from Carbohydrate Fermentation by Extraction with Solvent Mixture of Aniline, Pyridine and Aliphatic Alcohols with Less Than 5 Carbon Atoms**—Robert Alan Walmesley, Howwood, Scotland, to Imperial Chemical Industries, Ltd. No. 2,422,453. June 17, 1947.

**Diastatic Enzymes Obtained by Growing Endomycopsis fibuliger Yeast on Starch Containing Substrate**—Lynferd J. Wickerham, Peoria, Ill., to United States of America. No. 2,422,455. June 17, 1947.

**Emulsifying and Whipping Agent Made of Sorbitan Mono-Stearate and Ethylene Oxide**—Norman F. Johnston, Norwalk, Conn., to R. T. Vanderbilt Co., Inc., New York, N. Y. No. 2,422,486. June 17, 1947.

**Foods Dehydrated or Frozen During Passage Through Treating Unit**

(*Patents continued on page* 198)


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## PATENTS

(*Continued from page* 197)

**Equipped with Truck Tracks and Air Circulating System**—William J. Finnegan, Jacksonville Beach, Fla. No. 2,422,536. June 17, 1947.

**Citrus Fruits Freed from Bulk of Color and Ethereal Oil Content, Ground to Paste Consistency, Concentrated Under Atmospheric Pressure to Highly Viscous Mass with Added Sugar, Spread Into Thin Layer and Dried**—Zdenka Samisch, Rehoboth, Palestine. No. 2,422,588. June 17, 1947.

**Poultry Freed from Feathers by Mechanical Action of Rotating Radial Webs**—Edward J. Albright to E. J. Albright & Co., Chicago, Ill. No. 2,422,608. June 17, 1947.

**Stones Separated from Peas by Gravity During Fluming**—James A. Cleveland, Hoopeston, Ill., to Food Machinery Corp., San Jose, Calif. No. 2,422,657. June 24, 1947.

**Sugar Solution Purified, Decolorized and Deodorized by Treatment with Mixture of Oxide and Hydroxide of Magnesium, Heating, Filtering and Neutralization of Filtrate**—John J. Naugle, two-fifths to Andres Bay Trading Corp. and two-fifths to Cuban Dominican Sales Corp., New York, N. Y. No. 2,422,699. June 24, 1947.

**Whole Milk Spray Dried in Unit Designed to Direct Milk Particles Across Incoming Air Stream and Against Periphery of Conical Drying Chamber**—George Tooby, Prentice, Wis., to Richard C. Lilly, St. Paul, Minn. No. 2,422,706. June 24, 1947.

**Cocoa Solids Treated for Recovery of Theobromine** — Benjamin J. Zenea, Ozone Park, N. Y., to Rockwood & Co., Brooklyn, N. Y. No. 2,422,874. June 24, 1947.

**Dried Coconut Ground and Freed of Oil Content and Skin Tissue**—J. C. Forkner and J. H. Forkner, Fresno, Calif. No. 2,422,893. June 24, 1947.

**Fruit Juices Concentrated While Flowing Over Steam Heated, Corrugated and Baffled Plates**—Juan Draghi Lucero, Mendoza, Argentina. No. 2,423,035. June 24, 1947.

**Riboflavin Derivative Made by Treating Riboflavin with Gallic Acid in Presence of Dilute Mineral Acid and Heat**—Margaret R. Zentner, Newark, N. J., to Hoffman-La Roche, Inc., Nutley, N. J. No. 2,423,074. June 24, 1947.

**Fatty Materials Containing Protein Tissue Treated with Proteolytic Enzyme Preliminary to Recovery of Fat Content**—H. L. Keil, Clarendon Hills, Ill., to Armour & Co., Chicago, Ill. No. 2,423,102. July 1, 1947.

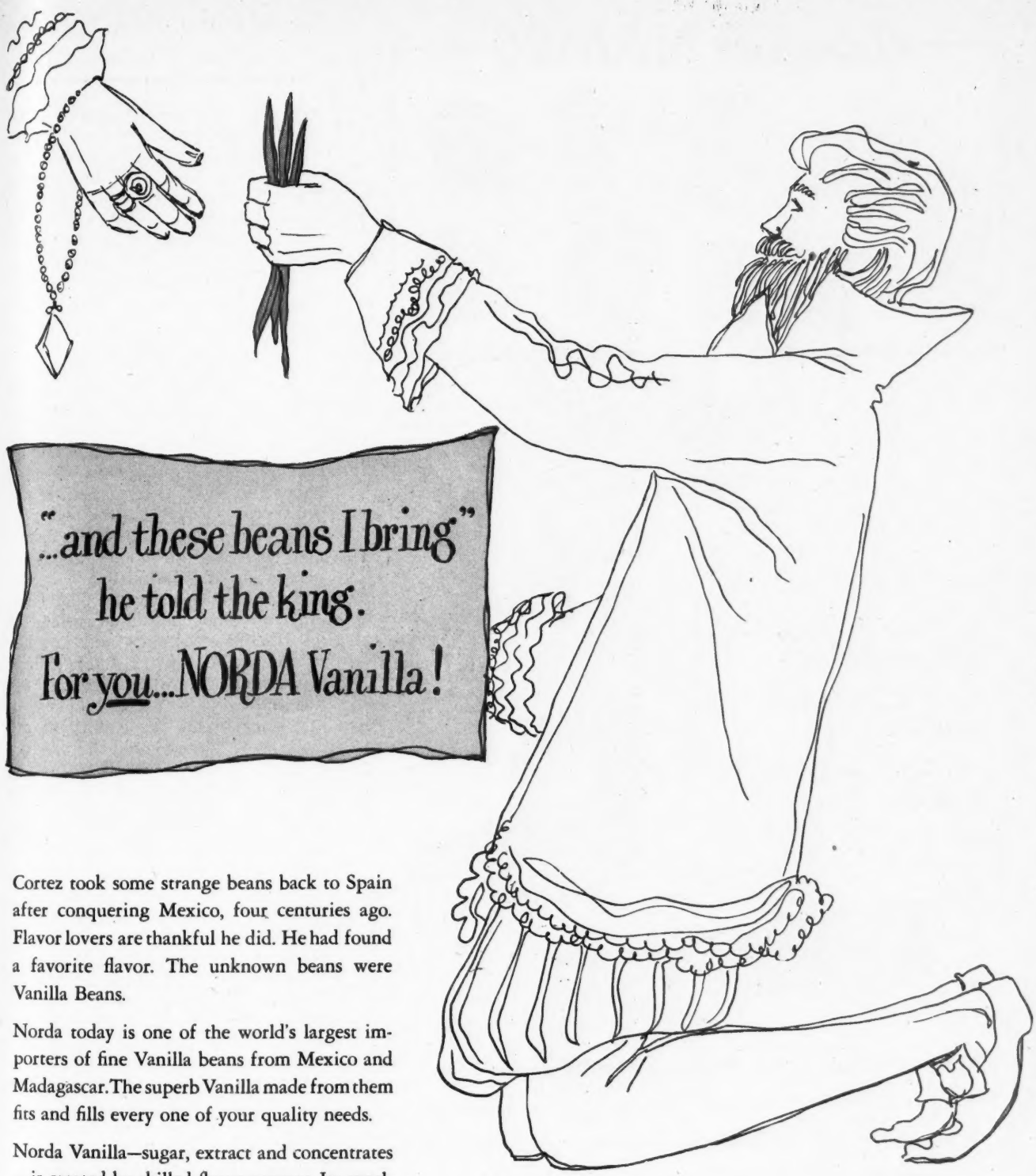
**Fish Mechanically Positioned for Removal of Head in Continuously Operating Machine**—Fred Parsons Brown, Braintree, Mass., to General Foods Corp., New York, N. Y. No. 2,423,174. July 1, 1947.

**Shell Eggs Treated at 110 to 140 Deg. F. for Retention of Edibility**—E. M. Funk, Columbia, Mo. No. 2,423,233. July 1, 1947.

**Curd Pressed into Cheese Shape with Central Tube for Draining Away Whey**—William Faehndrich, New York, N. Y. No. 2,423,300. July 1, 1947.

**Viscous Confectionery Liquid Stock Processed Under Pressure and Atmosphere of Gas Supplied Under Pressure Through Diffuser**—Justin J. Alikonis to Paul F. Beich Co., Bloomington, Ill. No. 2,424,950. July 29, 1947.

**Phosphoric Acid Composition Made by Mixing Finely Divided Starchy Material With Solution of Phosphoric Acid in Volatile Organic Solvent and Evaporating Solvents to Give Relatively Non-Hygroscopic, Dry, Finely Divided Final Product**—Royal Lee to Lee Foundation for Nutritional Research, Milwaukee, Wis. No. 2,424,992. Aug. 5, 1947.

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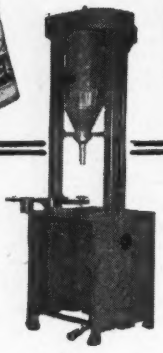

A

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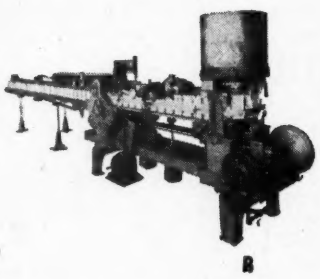
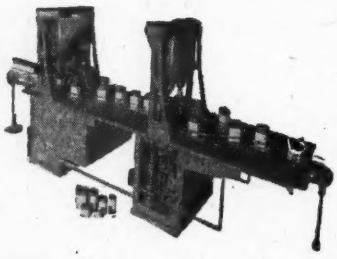


B



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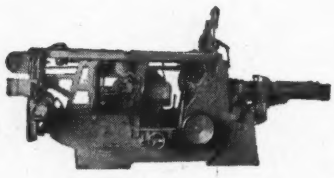

D

Well-known products from milady's powder, tangy spices, tasty puddings or powdered soap, all filled on S & S packaging machines. Bottles and cans, odd shapes, boxes or bags, there's an S & S packaging machine with speeds to suit your needs. Our engineering staff is always available to help in the solution of *your* problems.

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PACKAGING MACHINERY — PAPER BOX MACHINERY

4911 Summerdale Ave., Philadelphia 24, U. S. A.

FILLING : PACKAGING : WRAPPING MACHINES


## Sweet Potato Flour

(*Continued from page* 101)

ages or in bulk for institutional uses. A year-round source of a uniform product would be assured. For those who prefer a strong-flavored pie, this would give quite a satisfactory product. Limited tests indicate that a mixture of sweet potatoes and pumpkins makes a satisfactory pre-mixed base for the sections of the country that prefer pumpkin pie to sweet potato pie.

### With Dairy Products

A. D. Burke, former head of the dairy department, Alabama Polytechnic Institute, conducted tests on the use of Alamalt in ice cream.[1,2,3] He found that it could be used to supply two percent of the mixture, that it imparted a rich color, a delightful caramel flavor, and was able to replace about 40 percent of the stabilizer.

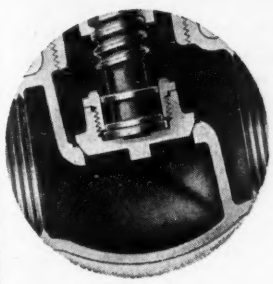
Two sales tests were conducted on ice creams, one of 300 gallons by an Opelika creamery and another of 200 gallons by the A.P.I. college creamery. According to plans, the 300 gallons from the Opelika creamery went to the trade without notice; the trade accepted the product without comment. The 200-gallon batch made by the A.P.I. college creamery went to specific stores with advance notice. Comments were favorable. Wartime regulations complicated further testing. The drug stores handling the A.P.I. creamery mix asked for more.

Alamalt makes an excellent milk shake if mixed properly; otherwise it settles and a poor product results. The fact that one local drug store in a sales test sold over $2,000 worth of Alamalt milk shakes in a period of 8 months provides evidence that the public will accept the product and come back for more. It should be stated that this drug store made a superior product, advertised it, and "pushed" its sale. Another drug store made such a poor product that the test was discontinued.

These enumerations of uses for the sweet potato might remind one of the magic medicine that cured headaches, neuralgia, sprains, colds, and indigestion. Yet it may be said for those who have worked with sweet potatoes that they have been most agreeably surprised at the many uses developed for them and the varied forms in which they may be used.

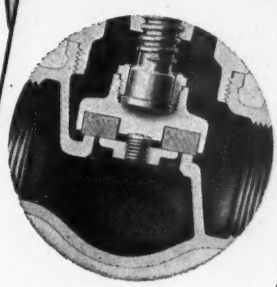
With the production of the sweet potato in the South as natural as

# *Guide for Selecting* KENNEDY BRONZE GLOBE VALVES



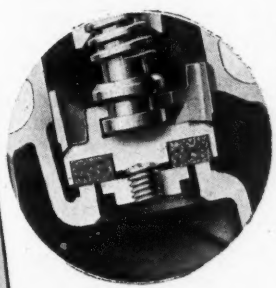
**BRONZE DISC**
***Screwed Bonnet***

This valve is designed for standard pressure, general service. Like all Kennedy Bronze Globe and Angle Valves this type can be repacked under pressure when wide open.



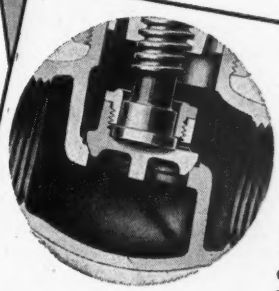
**RENEWABLE COMPOSITION DISC**
***Screwed Bonnet***

The discs in these standard-pressure valves are built to standard dimensions . . . those carried in stock by all supply houses. Kennedy offers various compositions . . . each selected to meet specific operating conditions. The exceptionally high raised seat assures longer disc life.



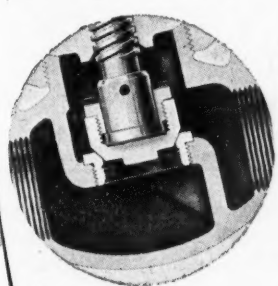
**RENEWABLE COMPOSITION DISC**
***Union Bonnet***

The convenient Slip-on Disc Holder speeds up renewing the disc on these 150 lb. Kennedy valves. This holder is accurately guided in the body by four guided prongs which maintain alignment and prevent binding.



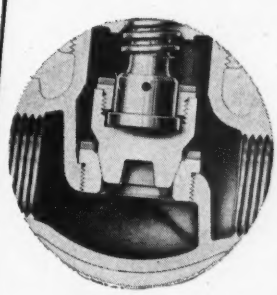
**REGRINDING DISC**
***Union Bonnet***

The discs of these 125 lb. and 200 lb. valves are designed to permit repeated regrinding . . . without removing the valve from the line. The body, bonnet, union bonnet ring and disc are made of the same metal as used for 300 lb. Kennedy valves.



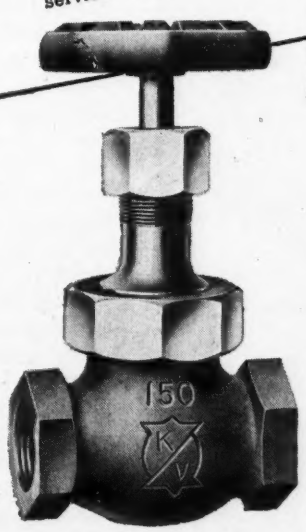
**FULL-WAY DISC**
***Union Bonnet***
**Renewable Seat Ring**

These 200 lb. and 300 lb. valves have renewable discs and seat rings of tough, wear resisting nickel-copper alloy. They can be furnished in special alloys to meet unusually severe service conditions.



**PLUG-TYPE DISC**
***Union Bonnet***
**Renewable Seat Ring**

The extra wide seating surfaces of these 200 lb. and 300 lb. Kennedy valves make them highly resistant to wire drawing. The plug-type disc design assures precise throttling control. Nickel-copper alloy for discs and seat rings are standard. Special alloys for unusual service conditions are available.




In addition to these bronze globe and angle valves, the extensive Kennedy line also includes bronze gate and check valves, iron body gate, globe, angle and check valves, malleable iron and bronze screwed fittings, and cast iron flanged fittings and flanges. Write for Catalog 63, describing all Kennedy products.

**BUY FROM YOUR LOCAL DISTRIBUTOR**

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**All Hubbert Kettle Shells are seamless, die drawn from one single sheet. Shells have no welds to crack, corrode, contaminate or leak**

**SEAMLESS SHELLS**

**SUPER QUALITY**

**EFFICIENT**

**SANITARY**

**DURABLE**

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**Hubbert Seamless Drawn Steam Jacketed Kettles are *first* choice with the nation's *finest* Food, Chemical and Drug Processors.**

**Tanks**
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**Kettles**
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**Special Equipment to *Your* Design in *Stainless Steel . . Nickel . . Monel***

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**B. H. HUBBERT & SON, Inc., 1311 South Ponca St., Baltimore 24, Md.**


cotton and pine trees and with so many uses possible, the sweet potato may some day occupy a much more important position in Southern agriculture than it does today.


**References**

1. *Southern Dairy Products Journal*, July, 1944.
2. *Southern Dairy Products Journal*, August, 1944.
3. *Ice Cream Field, July*, 1944.


*—End—*

## Fats From Coal

(*Continued from page* 89)

low atrophy of the liver. The supply of natural glycerine was impossible because of lack of natural fats. One tries to obtain it from sugar through fermentation. The yield of this biological method is, however, very bad. We consider it an organized nonsense to change the valuable sugar into glycerine with a bad yield in order to turn this afterwards into 'edible fat' with the help of highly doubtful, health damaging fatty acids. Furthermore, this fat is no substitute for natural fats because it contains neither unsaturated fatty acids nor phosphatides and other substances. It is pure fuel and therefore completely dispensible.

"We believe that it would be appropriate to utilize for human consumption all the natural fats which in the world at present are still being used for the production of soap, but to use the synthetic fat for the manufacture of soap."

## Food Aversions

(*Continued from page* 83)

"catch as catch can," associates such food with unpleasant memories and does not relish it.

A small child may develop a dislike for a pleasant fruit juice or food because it was used to disguise an unpleasant tasting medicine in the child's youth. One can always strike up a conversation with a member of the minority who feels, or thinks, that eating a certain food or combination of foods has caused a real or imaginary illness.

Personal interviews I have had with some 280 veterans bring out few food dislikes that will survive more than a year or two of civilian living. Young people forget the food dislikes caused by temporary military service more rapidly than older persons.

The situation with our population who were civilians during the war is quite different. Every woman shops to please her man and her family. During the war, the wife in the home bought what she could get within the ration points she had available.

When the man opened his lunch box, he might have preferred a cold roast beef sandwich to the one that was there. He didn't complain. When he got home, the little woman told him how she had stood in line for an hour to get the two oxtails they had for dinner. He patted her on the back and said, "Fine. Good work." After all, that was one way to help win the war.

Some of these wives were working in war factories, too, and had little time to shop in competition with women who could stand in a ration line for two hours or more.

### Situation Changed

Now all that has changed. The man of the house expects the kinds of food he likes and wants, and the wise woman tries to cater to these tastes. Many minor dislikes for foods were submerged and overlooked by civilians during the war. Now these dislikes have returned with even greater emphasis.

As one salesman of space in one of our leading weekly magazines put it: "I dislike cut asparagus. I like asparagus spears. During the war I ate the cut asparagus and said nothing. Today my wife tries to serve me only asparagus spears." Of course, that is a minor dislike, but it is definitely influencing that one family's purchase of asparagus today.

Foods that enjoyed a war-made popularity among American civilians face some real problems ahead. While war shortages gave some of these foods a wide, free sampling by the masses, few of them will retain their 1945 volume. Most will probably hold a percentage of the gain above 1940—the percentage depending on the ratio of "likes" to aversions that are retained as the months go by.

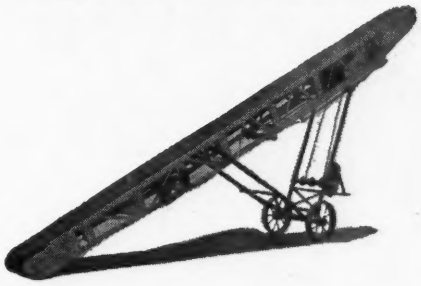
Sandwich spreads of various kinds, meat extenders or substitutes, dehydrated soups and other dehydrated foods face the toughest fight to retain a high percentage of the wartime peak volume.

Individual companies in the affected industries will have to work closely together to survive both the "battle of the brands" and to overcome the civilian aversions which may have developed toward some products of that industry.


Farquhar FREIGHT CONVEYORS

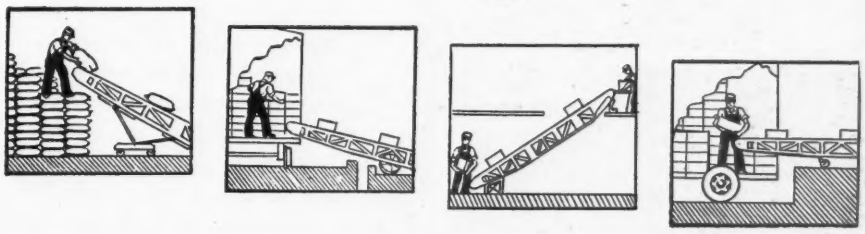
*. . . For faster handling of freight.*
*. . . For more effective control.*
*. . . For greater use of man power.*

MONEY SAVING TIME SAVING



**FEATHERWEIGHT MODEL 391**

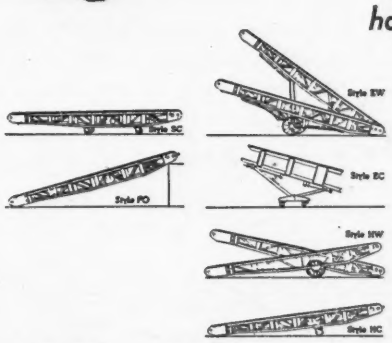
Handles bags, boxes, cartons, etc., weighing up to 125 pounds each. 4 Standard sizes—all easily moved by one man—14', 17', 20' and 23' lengths. Special sizes to suit requirements. Ask for Bulletin No. 391.



**HEAVY DUTY MODEL 432**

Handles bags, boxes, cartons, bales, etc., weighing up to 500 pounds. Standard sizes—18", 24" and 30" wide and lengths from 17' to 27'—other sizes to suit requirements. Ask for Bulletin No. 432.

*Both models are designed for horizontal and elevating application.*



Flexibility of mounting to fit requirements.

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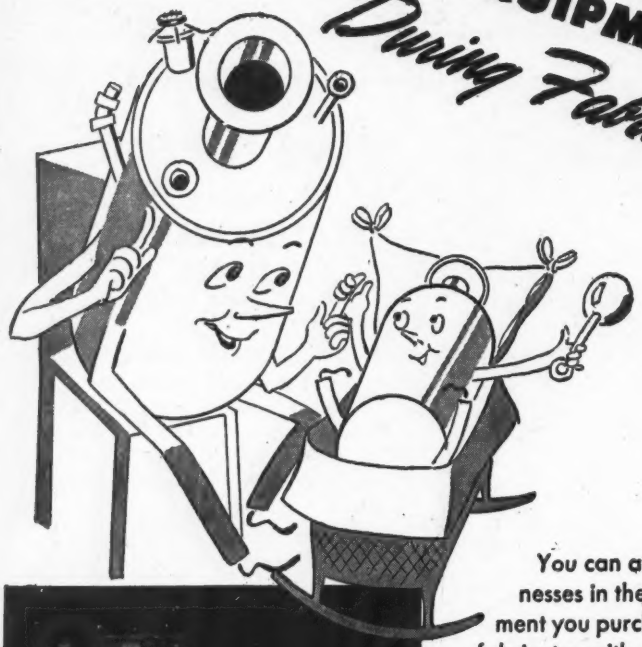
PROTECTING YOUR STAINLESS STEEL EQUIPMENT During Fabrication



You can avoid hidden weaknesses in the processing equipment you purchase by selecting a fabricator with specialized experience in working with this alloy. Stainless steel is a tricky metal to work. When you bend it, form it, weld it, your fabricator must use shop procedures that safeguard the original properties of the metal. And he must have the plant machinery, engineering skill, and trained manpower to carry out these protective procedures.

As custom builders of processing equipment working *exclusively* with stainless steel alloy—we offer this specialization to our customers. It assures you processing equipment with no hidden weaknesses—equipment that lasts longer, works more efficiently for your application. Consult with us.

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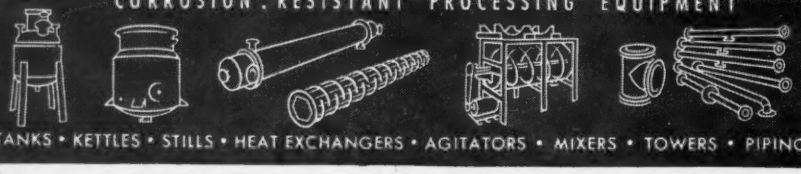
*Guards Alloys in Fabrication*

SEND FOR THIS VALUABLE BOOK

A request on your letterhead will bring our guide, "What to Look For When You Specify Stainless Steel for Your Processing Equipment."

CORROSION . RESISTANT PROCESSING EQUIPMENT



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Consistent industry and product publicity with new and tasty service suggestions will help speed the restoration of these foods to the shopping lists.

### Buyers Are Particular

Production men must restore pre-war quality to our food products and, if possible, establish even higher standards. American food buyers are quality and value conscious today.

Fourteen million veterans had quality foods *given to them* to eat while they were in the service. They are back in civilian clothes now. They are definitely quality conscious today when they shop *with their own money* for foods.

The brightest hope is that the American people forget quickly. Food dislikes frequently disappear with the passing of time.

And then, too, we have an ever changing population. There are at least 15,000,000 food consumers in the U. S. who have no wartime food aversions because they have been born since Pearl Harbor Day.

*—End—*

## Citrus Crossroads

(*Continued from page* 94)

essed, orange or grapefruit, moved up and down with consumers' incomes. As citrus output rose over the long pull, prices fell, at least relatively. The lowering of average prices effected by the growth in processing therefore found 1946 citrus spending on, not off, the beam.

That's a fundamental reason why citrus markets recovered much of their former strength this past spring and summer. It's true the jump in 1946 citrus supplies was more than the market could take. But the downward reaction went too far. Basic relations between what consumers were spending and could afford for citrus were not that unbalanced. Hence the snapback.

### Long-Range Problem

However, all that has to do only with the temporary postwar adjustment and readjustment. Basically, 1947 experience does bring out the long-range problem. This year, supplies of fresh fruit expanded nearly one-fourth over last year to 10,000,000,000 lb. Citrus groves were yielding more fruit, and canners, in response to winter price weakness, pared their pack more than 10 percent, so shipments of fresh fruit

were doubly enlarged. Now, once more, American citrus trees promise a larger yield for next year. How can the product all be profitably marketed?

Still greater consumption through canning is one natural answer. And chances are that citrus processing will advance in 1947-1948. For the reduced 1946-1947 juice pack fell 7 or 8 percent behind sales to consumers during the past year, and so swollen stocks of juices have been slashed 40 percent. But beyond that, it's a question of improving the quality of the canned product enough to widen consumer acceptance, and of reducing costs of both fresh and processed fruits.

### Distribution Costs High

Growers paint a black picture of the pyramid of distribution costs that weighs down on them when production begins to outstrip what the market will take. One Florida grower cited the following figures as his own 1947 experience of the cost of one crate of oranges to the consumer:

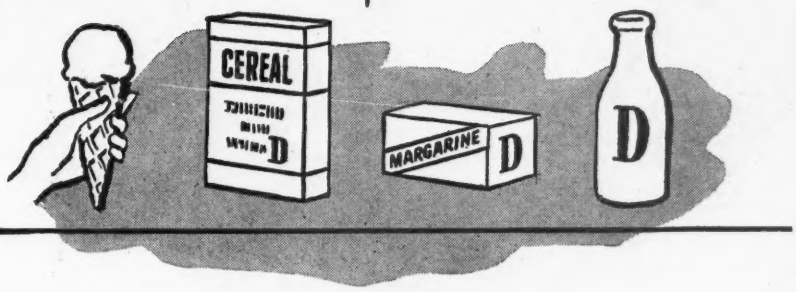
| | |
|---|---|
| Cost of growing | $0.50 |
| Picking, packing, and boxing | 0.95 |
| Freight to New York | 0.77 |
| Selling expense | 0.10 |
| Trucking to distributor | 0.25 |
| Distributor's markup | 0.50 |
| Trucking to retailer | 0.25 |
| Cost to retailer | $3.32 |
| Retailer's ⅓ markup | 1.11 |
| Cost to consumer of 200 oranges (= 90 lb.) | $4.43 |

On this basis the grower gets just over 10 percent of the consumer's cost of 27 cents a dozen. This is only enough to cover his out-of-pocket costs. It does not allow him any profit for his work or expense. And, on this basis, it would appear a forlorn hope to look for radical cost changes, in fresh fruit distribution, adequate to solve the long-range problem.

The cost structure for fresh citrus marketing creates a sort of umbrella over the processing branch of the business. Potential savings to be made by processing act as a continual incentive to the industry.

Public acceptance, of course, is the great hurdle. Total citrus output is now equivalent to almost an orange a day for every American if you translate grapefruit and canned juice on a poundage basis. There's always room for expansion in consumption, but by now it has shrunk pretty small. Of course, if foreigners could afford American citrus products, the potential physical use would be enormous—but with the world now severely pinched by a shortage of dollar exchange to buy here, export prospects right now are darkening, if anything.


FORTIFIED WITH VITAMIN D

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PURE CRYSTALLINE VITAMIN $D_2$

and you add

Sales Appeal...

An already health-conscious public is becoming more and more aware of the nutritional benefits of foods fortified with vitamin D.

This interest in personal and family health is reflected in homemakers' buying habits. And merchandising authorities agree that *nutritive value* today is one of the most important factors in the marketing of food products.

Milk, ice cream, cereal foods, margarine are a few of the great variety of food products easily and accurately fortified by adding Calciferol, pure crystalline vitamin $D_2$. Unvarying in antirachitic potency, the recommended daily level of 400 U.S.P. units of vitamin D can be supplied exactly by 10 micrograms of Calciferol in crystal form and by specified amounts of Calciferol as supplied in oil carrier, or in propylene glycol for the fortification of fluid milk.

You can add sales appeal to your product surely and simply by fortification with Calciferol. *For detailed information, please write:*

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AMINO ACIDS

| | |
|---|---|
| Tryptophane | Cystine |
| Phenylalanine | Tyrosine |
| Methionine | Leucine |
| Valine | Glutamic Acid |

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**In every industry today, materials handling is a very common subject for discussion. Plant engineers realize, probably more clearly than ever before, that the application of well-designed conveying equipment is a great step toward increased production and greater operating economy. There isn't anything new about efficient materials handling. For nearly half a century Mathews Conveyers and Conveyer Systems have been serving production, saving time and creating economy for manufacturers throughout the United States and Canada.**

**The benefit of this long and varied experience and the facilities of three modern plants is available today to both light and heavy industry. That is why, when talk turns to modern materials handling, that Mathews Conveyer service is frequently brought into the discussion — and it is quite logical that it should be — for this conveyer service is complete from preliminary engineering to erection in the field. Whatever a load weighs — whether a few pounds or many tons — there is Mathews equipment which will handle it efficiently.**

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*Engineering Offices or Sales Agencies in Principal American and Canadian Cities*

It would be wrong, out of an excess of gloom, to expect a crisis to overtake the citrus industry in short order. But it is plain a new crossroads has been reached. Output cannot continually travel upwards and marketing stand still. Another revolution in processing, for home or foreign use, is called for; or a revolution in fresh distribution costs; or a clamp on output. Quite possibly, new revolutions may proceed in all directions at once. But processors, as never before, have both a problem and an opportunity to face. The 1947-1948 story may well tell down which road the fruit business will roll.

*—End—*

## Peach Juice

(*Continued from page* 98)

studied with this type of operation in mind, the data revealed that the use of filter aid acts more as a deterrent than as a help in a continuous operation.

Insofar as can be determined, no filter press unit suitable for continuously pressing peach pulp under the desired conditions has heretofore been designed. For this reason arrangements are under consideration at the present time for the design of a continuous press.

Considerable optimism is created in our minds by the summation, characteristically conservative, presented by the director of the project: "It is believed that a filter press designed to meet the requirements of this problem can be worked out to give continuous production of peach juice."

*—End—*

## Electrical Maintenance

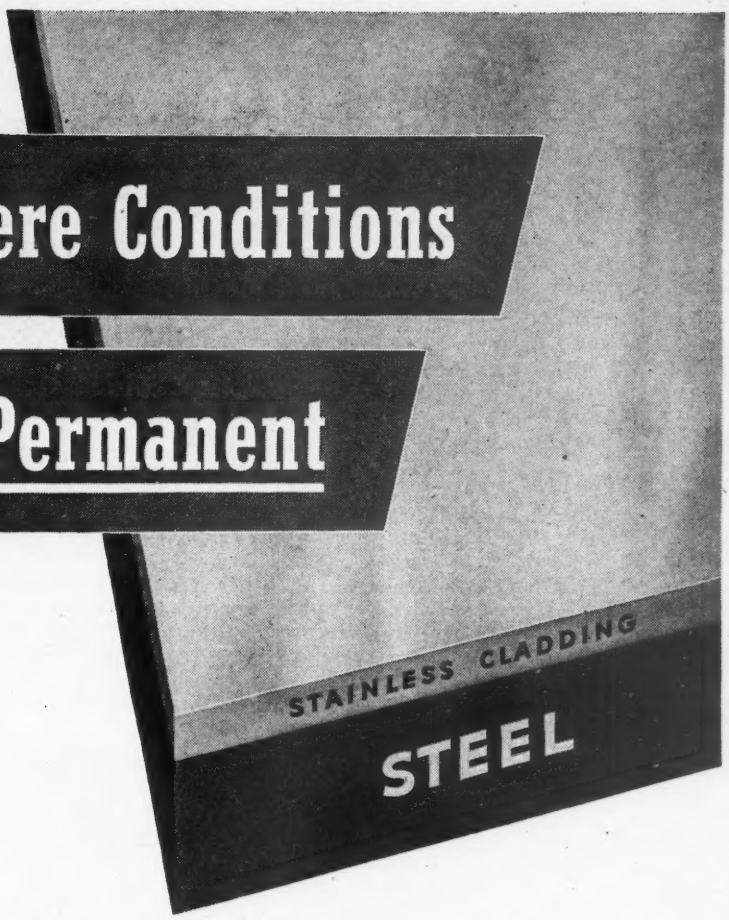
(*Continued from page* 87)

future ordering. Maintenance files should contain renewal part catalogs for installed apparatus, as proper ordering of renewal parts can be accomplished by using the manufacturer's style numbers for the parts involved. The proper renewal parts stock represents the best insurance against production delays and apparatus outage.

Spare motors and controls carried in stock for emergency replacement should be stored in a dry location that is also clean and, whenever possible, free from sudden atmospheric changes. These spares also represent good insur-

# Even Under Severe Conditions

# ...the Bond is Permanent




All known types of bond strength tests on Lukens Stainless-Clad Steels add up to this: bond strength equals or exceeds that of the steel backing plate. The results of one such type of test—a standard ASTM-ASME shear strength test made at the bond line on stock plates taken at random—are tabulated below.

The Lukens method of manufacture assures this permanent bond. It also provides a uniform thickness of cladding—a matter of prime importance in fabrication.

There is a whole family of Lukens Clad Steels—the widest variety of claddings available anywhere. For information on Lukens Stainless-Clad Steels, write for Bulletin 338; on Lukens Nickel-Clad, Inconel-Clad and Monel-Clad Steels, ask for Bulletin 255. Lukens Steel Company, 401 Lukens Building, Coatesville, Pennsylvania.

**Shear Strength of the Bond in Lukens Stainless-Clad Steel Plates in the Annealed Condition**

| Type | Gauge | Percent Cladding | Shear Strength *(psi) | |
|---|---|---|---|---|
| | | | Minimum | Maximum |
| 304 | ½" | 20 | 44,900 | 54,900 |
| 316 | ½" | 20 | 46,400 | 52,600 |
| 316 | ¾" | 10 | 40,700 | 55,900 |
| 347 | ½" | 10 | 44,400 | 48,000 |
| 410 | 1" | 10 | 42,200 | 47,300 |

*ASME specified minimum shear strength of clad steel bond is 20,000 psi.

**LUKENS**
Nickel-Clad Stainless-Clad
Inconel-Clad Monel-Clad
**STEELS**

**SOLID METAL ADVANTAGES WITH CLAD STEEL ECONOMY**

# FIGURE 2228 LUNKENHEIMER NEW 200 LB. BRONZE UNION BONNET GATE VALVE

## BUILT TO LUNKENHEIMER STANDARDS . . . FOR BETTER SERVICE!

**DESIGNED WITH FULL CYLINDRICAL BODY SECTIONS** to provide maximum resistance against distortion of the valve body and seats due to pipe line stresses and internal pressure strains. Exhaustive tests made under conditions far more severe than those encountered in actual service clearly demonstrate that this design will not distort and will maintain initial proportions and seat tightness.

All parts are heavy and rugged and of the finest materials to insure ample factors of safey against pressure, temperature and operating strains.

Send for descriptive circular No. 534.

### NOTE THESE FEATURES

***Malleable Iron Handwheel***—Non-heat, easy, comfortable grip.

***Rising Stem***—Made of a distinctive silicon bronze alloy, developed and patented by Lunkenheimer. Remarkably wear-resistant, eliminates stem-thread failures. Exceptionally heavy stem head.

***Hexagon Head Gland***—Permits use of a wrench to loosen gland. Facilitates repacking.

***Stuffing Box***—Large and deep. Long thread provides solid engagement with packing nut to form a tight joint when fully packed.

***Repacking Seats***—Repackable under pressure when wide open. Repacking seats above stem thread, perfectly machined.

***Bonnet***—Union bonnet 2 in. and smaller; bolted bonnet 2½ in. and 3 in. Both provide a strong tight joint; easily disassembled.

***Body***—Made of high grade bronze which meets the A.S.T.M. Specification B 61. Heavy, rugged proportions and straight through full flow areas.

***Double Wedge Disc***—Nickel alloy, ball and socket bearing; no internal wedge or pin. Discs readily adjust themselves to taper seats, insuring a tight valve.

***Stay-On Discs***—Will not drop off stem when assembling valve. Bevelled disc wing guides and body channels make assembly easy.

**PHONE YOUR LUNKENHEIMER DISTRIBUTOR**

Fig. 2228 valves and companion valves are available through your Lunkenheimer Distributor. Call on him for prompt service and the best in valves . . . Lunkenheimer.

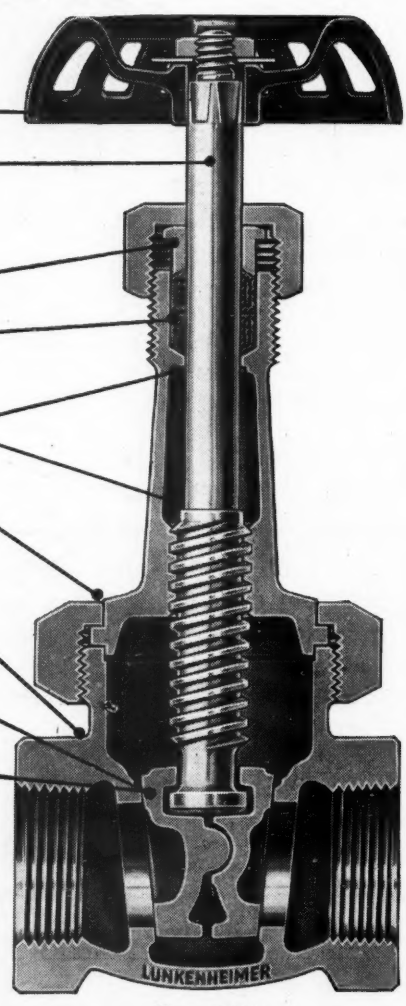



Fig. 2228

ESTABLISHED 1862

THE LUNKENHEIMER CO.

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NEW YORK 13, CHICAGO 6, BOSTON 10, PHILADELPHIA 34, EXPORT DEPT. 318-322 HUDSON ST., NEW YORK 13, N. Y.


ance and the investment should be protected by proper care.

Another important maintenance item is that of recording failures of motors and control. This does not constitute the most pleasant task, but if records are compiled with a view of preventing failures or at least reducing them, this work then becomes one of analysis that can be made profitable to the plant overall production, and a consequent overall reduction in operating costs.

Preventive maintenance means keeping equipment in satisfactory operating conditions at all times. The recognition that plant maintenance departments receive depends largely on performance—the ability to keep in full production the equipment they are responsible for.

*—End—*

## Cooling After Blanching

(*Continued from page* 107)

Air, passing through the belt, was cooled before returning to the fan by contact with a refrigerated tractor radiator, with 17,500 sq.in. of exposed surface. Whenever the air temperature increased, it was cooled by brine (0 deg. to 5 deg. F.), which circulated through the radiator at the rate of 40 gal. per min. by means of a direct-acting thermostatic valve. A corresponding volume of warmer brine was returned to the central brine tank for recooling.

### Cooling Rates

Vegetables were blanched at 212 deg. F. for periods sufficient to insure uniform heating. Final temperatures of cooled products were determined by inserting thermometer bulbs in the center of end-opening cartons with Cellophane liners.

Under similar conditions, the three vegetables varied in their cooling rates. The shape, texture and density of the vegetables probably contribute to these variations. The shape of the vegetables may influence the rate of heat transfer, depending upon the area exposed to the cooling medium and turbulence created by irregularly shaped vegetables immersed in a flume unit.

Flumed peas cooled more slowly than snap beans or lima beans. This may have been due to the spherical shape of the peas, resulting in the least amount of turbulence during water immersion. Insertion of small, inclined planes in the bottom of the trough might appreciably reduce cooling time by fluming.

The cold air stream system cooled vegetables to the lowest degree. If vegetables are subsequently to be frozen, additional refrigeration during cooling in air or water may substantially increase the capacity of freezers. Consequently, increased production would offset the cost of refrigeration.

It would appear more advantageous to use air rather than the water cooling system because recirculated air could be purified by filters. Recirculated cold water, on the other hand, would probably result in an undesirably high bacterial content. Since a greater part of blanching heat is dissipated in a few seconds in unrefrigerated water, it would seem desirable to precede the refrigerated air cooling unit with several water sprays.

### Weight Changes

Overall weight changes during blanching and cooling were obtained by blanching known amounts of each vegetable and weighing after cooling. Weight changes due to cooling alone were determined by weighing samples before and after blanching and deducting this loss from the overall weight change.

Although snap beans were water-blanched for a shorter period than lima beans, the weight loss was greater. Small weight losses of electronically blanched snap beans and lima beans were due either to moisture vaporization or exudation of cellular juices.

Weight losses in blanching are regained by cooling in flumes or under water sprays. Weight increases after water cooling may be attributed to water adhering to the vegetables or an increased water holding capacity of vegetable colloids. The moisture uptake varies with the method of blanching and the type of vegetable. It is greater with snap beans than with lima beans.

Air cooling resulted in a weight loss due to the drying action of the air stream. Drying, in this case, might be overcome by atomizing water into the cold air before cooling vegetables.


### Acknowledgment

The authors wish to thank C. S. Pederson and Leon Tyler for their assistance in construction of equipment and preparation of samples.


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3. A. I. Nelson, J. T. R. Nickerson and C. F. Evers, "Research on Production Basis," *Food Industries*, vol. 16, 432-434, 487-488, 1944.



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Follow the leaders! Order your open-end envelopes from Brown — manufactured exactly to your specifications, in color, size and capacity. The volume production facilities of our plant, our long and thorough experience in every phase of packeting, are building sales records at low cost. Let us quote on open-end envelopes for you.

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## Tough Jobs

*(Continued from page 77)*

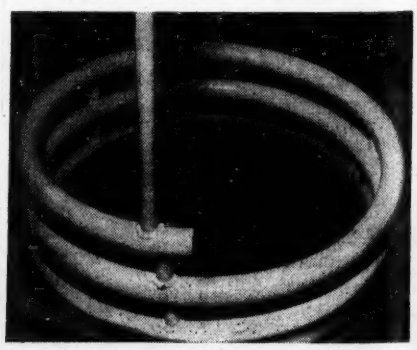
factory for the refrigeration coils as the salt attacks the galvanizing. Stainless steel would be ideal, but 2 in. pipe coils of this material cost several hundred dollars for each vat. For this reason ordinary iron pipe coils have been used and give many years of service. They rust badly, however, under the action of the salt, soon discolor the brine and every month or so each vat must be drained and washed out and the rust cleaned off the pipe coils. Cleaning the pipes is a very hard job under rather crowded conditions.

### Corrosion Resisting Paints

We considered the possibility of using some of the new corrosion resisting paints on the pipe coils. After several months of testing, in which many different paints were tried, we were able to find a paint, Amercoat, that was rather easy to apply, would pass the rigid requirements of the U. S. Meat Inspection Service for materials used in contact with food items, and would protect the pipe coils from the action of the salt brine.

We then had the pipe coils thoroughly cleaned by sand blasting, applied several coats of the new paint, according to the manufacturer's specifications, and now have pipe coils that no longer require frequent cleaning and do not contaminate the curing solutions.

The smaller coils were removed and sent out to be sand blasted before painting. Others, which were too large to be removed, were sand plasted right in place and then painted. We use rubber hose instead of pipe to distribute the brine to the stations where it is used, the connections being made with stainless steel fittings and valves.



**IRON COILS, used to refrigerate curing brine, were sand blasted and given five coats of Amercoat. This prevented rust and eliminated a mean cleaning job.**

# For every food plant process . . .
# CRANE supplies the piping

Canning, bottling, packing, freezing . . . whatever the process, you can get all the piping equipment you need from Crane—for all piping systems, from end to end.

**Take this dairy plant, for instance.** Here's an idea of how the complete Crane line allows almost limitless standardization of piping equipment . . . supplies everything you need . . . and assures this 3-way advantage:

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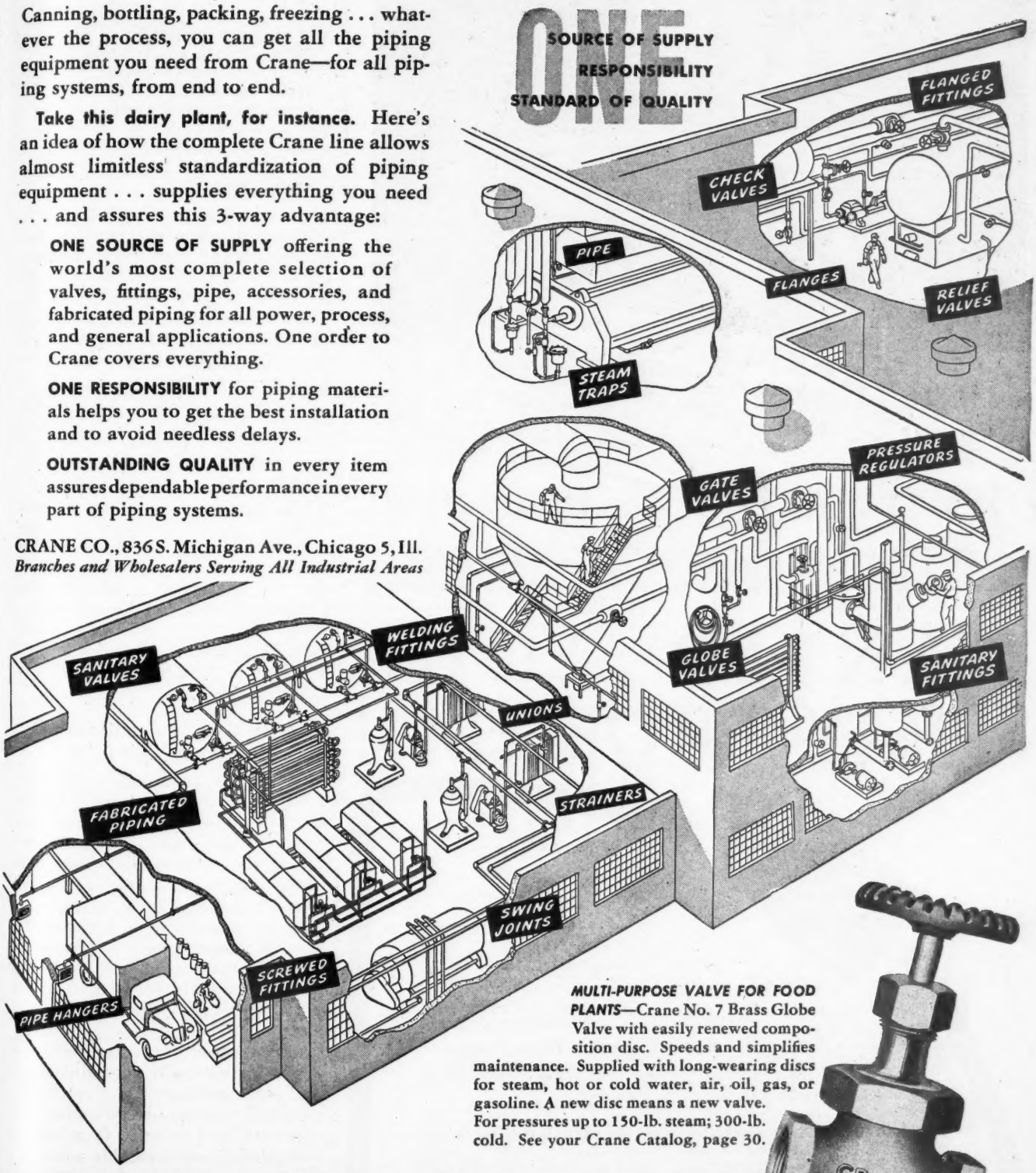


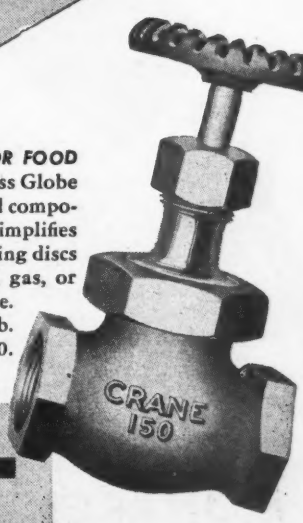


***MULTI-PURPOSE VALVE FOR FOOD PLANTS***—Crane No. 7 Brass Globe Valve with easily renewed composition disc. Speeds and simplifies maintenance. Supplied with long-wearing discs for steam, hot or cold water, air, oil, gas, or gasoline. A new disc means a new valve. For pressures up to 150-lb. steam; 300-lb. cold. See your Crane Catalog, page 30.

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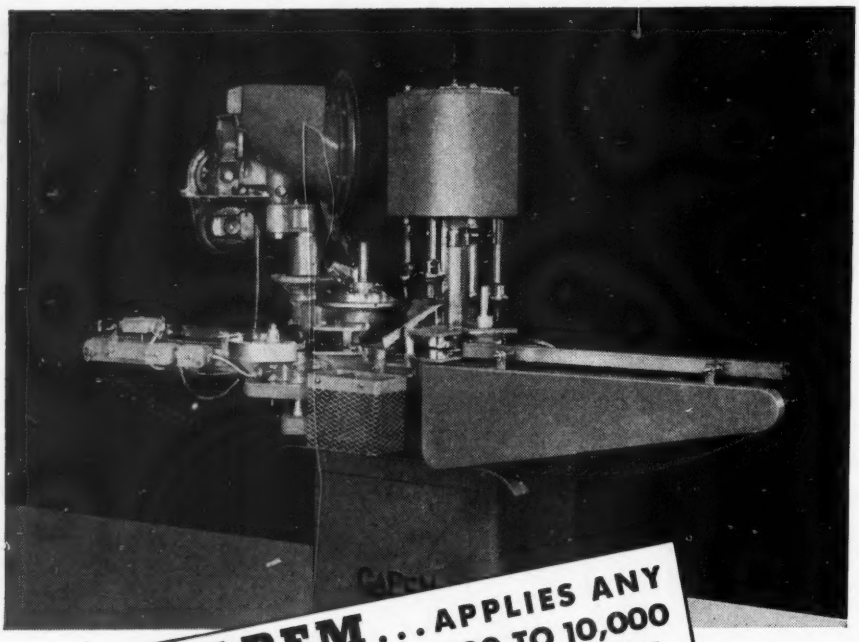

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Available in 1, 2, 4, 6 and 8 spindle models

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**CONSOLIDATED PACKAGING MACHINERY CORP.**

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# WANTED: YOUR SPRAY PROBLEMS!

Fig. 629

DO YOU WANT TO:

Wax Fruits?
Rinse Vegetables?
Powder Milk?
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Humidity Banana Rooms?

Monarch Spray Nozzles are doing these and innumerable other Food Processing jobs. If your liquid can be sprayed with direct pressure Monarch can supply the nozzles.

Outline your problem so that we may make recommendations.

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**MONARCH MFG. WORKS, INC.**

**2517 E. Ontario St.** **Philadelphia 34, Pa.**

## General Mills

(*Continued from page* 112)

Costs and margin indications on the proposed or developed product
Cost of entering new markets
New Product Evaluation
Consumer use and reaction tests
Regional consumer tests
Trade reactions
Preliminary market tests
Product Naming
Selection of name
Psychological tests
Legal clearance

Once a manufacturer has uncovered an idea, proved that it is basically sound, and has convinced himself it has market possibilities, he has established two-thirds of the base for a new product. Without the remaining third, however, that base will topple as easily as a tripod with one leg missing.

One large, national, non-food advertiser uses the phrase "Quality of a Product Is Essential to Continuing Success." That statement is equally true in the food industry, for no grocery product can succeed without quality—without a superior formula. By formula, in this case, we mean not only the combination of ingredients but also the processing and handling technics which convert simple raw materials into products that mean convenience in the kitchen and pleasure at the table.

### After Commercial Research Comes Flavor

The first requirement of any food, of course, is flavor. Everything that passes human lips—the food we eat, the beverages we drink, the tobacco we smoke, the antiseptic we gargle—is judged partially by the way it "tastes." We may force down some bitter medicine because the doctor tells us we need it, but if we can find an equally effective substitute with a more pleasing flavor, we'll choose it every time.

Since nature has been generous in supplying naturally appealing foods and since culinary art already has greatly improved nature's offerings, any new food product faces severe competition. A vegetable soup, for example, must vie for the consumer's dollar not only with other vegetable soups, but with every other food. It is no trouble to begin a meal with a fruit cocktail instead of a soup, or to skip the first course, and add a few more vegetables to the salad. The cost is about the same, and the soup will

win only when it catches the "flavor fancy" of the consumer.

However, it is not enough that the flavor of a food product be simply "appealing"; it must also be distinctive. It must add a new "note" to the "symphony" that modern families demand in their meals. If a new product tastes exactly like a dozen or so other established foods, the housewife will have little incentive for buying it. Certainly she will see no reason for changing firmly-entrenched shopping and cooking habits.

On the other hand, a food which is truly "different" has every chance of becoming number one on a great many shopping lists. Psychologists have found that the three senses through which we detect flavor (tongue, taste, smell and touch) are subject to fatigue. They actually become "tired" of the same "tastes" repeated time after time and will not respond to them fully. Consequently, we most enjoy meals which consist of foods with contrasting flavors. Any product which is appealingly distinctive—which helps the housewife put contrast into her meals—has at least one foot on the ladder of success.

To benefit the producer fully, that product must also be readily recognized. If possible, its flavor should be the type that can be conjured mentally. Almost anyone can recall the tart, yet semi-sweet flavor of an apple pie even though he hasn't tasted one for months, and a food product which captures that elusive quality has inestimable value. Its flavor serves as a built-in trade-mark which will invariably be identified with its brand name and its producer.

### Packaging for Stability

Finally, the flavor of a new food product must be stable. Although packaging science has performed wonders in protecting foods, it still cannot compensate for incompatible ingredients. Under normal nation-wide marketing systems, products may remain in warehouses or on grocers' shelves from eight months to a year, and only those which retain their consumer appeal for that length of time can hope for continued success. Since the adverse publicity resulting from relatively few "spoiled" packages may destroy the work of a carefully conducted sales and advertising campaign, stability becomes of prime importance and stability can be achieved by scientific formulation and exhaustive testing. Only when a product has proved beyond doubt its ability to survive a normal mar-


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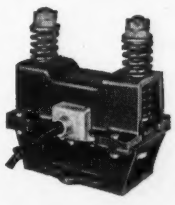

Banged-up and dented bins and hoppers tell a sad story —of work stoppages because valuable labor had to take time out to cuss and pound.

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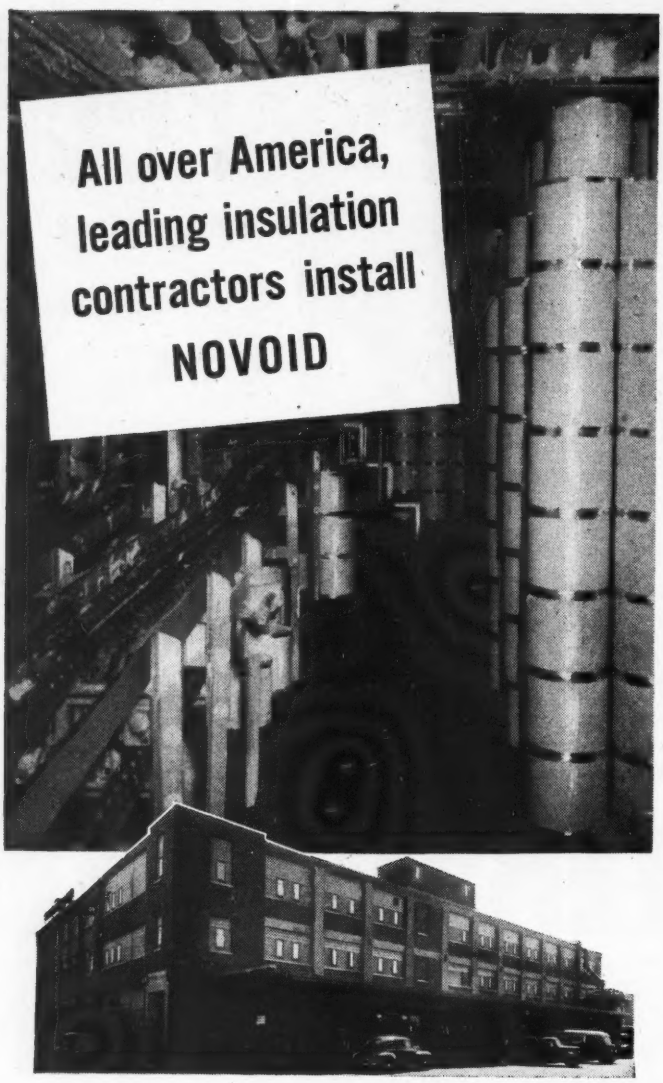


**EXTERIOR**, and one of the hardening rooms in new ice cream plant of H. P. Hood & Sons, Charlestown, Mass. The insulation is Novoid Corkboard erected by A. F. Underhill, Inc., Novoid distributor in Cambridge, one of New England's outstanding insulation experts.

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For complete facts about Corkboard, Mineral Wool Board, and sundries especially developed to make low temperature insulations most efficient, write to Cork Import Corporation, 39 Park Place, Englewood, N. J.

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keting period (with a reasonable margin of safety) is it ready for commercial production.

In this busy, modern age, convenience of use is nearly as important as flavor. Because housewives are socially and economically more active than ever before, they are constantly on the look-out for food products that will save time and labor. On the other hand, they have definite, well-established buying habits which they will break only if they see an unusual opportunity for gaining leisure time or more interesting meals. If, for example, a housewife has been baking homemade white cakes for 15 years, she will not switch to a white cake "ready mix" unless that mix is not only as good as, or better, than her own product, but is much more easily prepared. In view of these well-known facts, a good rule of thumb might go something like this: New commercial food specialties must be more easily prepared for the table than similar homemade dishes—or they must be so superior in flavor and allied appeals that the convenience factor is made of secondary importance.

### Economy

However, neither flavor nor convenience can be successfully gained at the expense of economy. From the producer's standpoint a new product must, of course, be adapted to mass marketing and allow reasonable profits to the manufacturer, wholesaler and retailer. From the standpoint of the homemaker, it must be attractively low in price.

Although these facts are self-evident, they are charged with hidden problems. For example, it is not enough that a new product be priced in line with commercial competition; it must also meet or approximately meet the price of similar homemade dishes. The housewife who has been baking homemade cakes will not switch to a "ready-mix" if she has to jettison her budget to do it.

Betty Crocker Pea Soup Ingredients, latest in General Mills' line of soups, grew into a million-dollar-a-year product in less than a year largely because it combined quality with economy. At September, 1946, prices a bowl of soup prepared from one popular home recipe cost the homemaker 0.357 cent per ounce; at the same time, reconstituted Betty Crocker Pea Soup cost 0.388 cent per ounce. In other words, for slightly more than three-hundredths of a cent per ounce, the housewife could save many hours, while still

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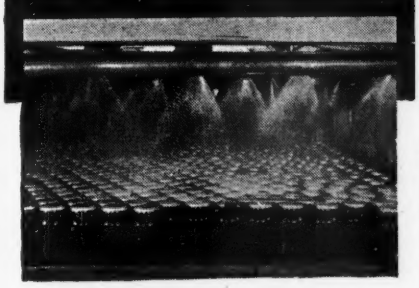

Vortex pasteurizers assure positive, accurate control of temperature and time, plus the advantage of completely automatic operation.

Thermal transfer is achieved through the medium of atomized water sprays, and temperature zones are designed with careful attention to heat reclamation so that consumption of steam is as economical as possible. Other design features include the patented "walking beam" conveyor, smooth hydraulic drive and a complete absence of gears, cams or chains.

Years of complete satisfaction are certain because of the durability of the design and measures taken to eliminate corrosion. It will pay you to get all the facts about the advantages of VORTEX machines for either pasteurization or cooling of foods. Send us your requirements and write for new technical bulletin.

BARRY-WEHMILLER MACHINERY CO.
1946 . . . Our 61st Anniversary
St. Louis, Mo., U. S. A.


serving a soup comparable in flavor, texture and aroma. Obviously, that is buying convenience at a reasonable price—and homemakers have been buying it regularly.

**Nutritional Soundness**

Finally, for the benefit of both manufacturer and consumer, a new food product must be sound nutritionally. The importance of a well-nourished society needs no emphasis; World War II has shown that our very existence may depend largely upon the health and vigor of our people, and certainly universal economic security—a high national standard of living—can come only when Americans are properly nourished, physically and mentally able to "do a full day's work for a full day's pay."

Since processed foods are playing an increasingly important role in the American diet, they must assume proportionate responsibility in supplying the elements of good nutrition. However, the food processor need not follow his humanitarian or patriotic instincts to convince himself of the importance of sound nutrition. He need only consult his sales figures to find that, with few exceptions, products having recognized food value lead the list. True, some food specialties, notably cakes and confectionery, are eaten for pure pleasure, regardless of nutritional considerations, but that does not alter the general fact that *most* grocery products depend upon food value for part of their consumer appeal.

This means simply that in evaluating a new product idea, the manufacturer must ask himself these questions: Does the formula contain one or more important nutritional factors—proteins, vitamins, minerals? Can original food values be retained during processing? Can the food be fortified to remedy deficiencies which do exist? If he must answer "No" to these questions and if he is not dealing with one of the few exceptional specialties, he is on dangerously thin ice and had better review his formula.

These, then, are the cornerstones of a successful new food specialty —a sound idea, a market opportunity and a superior product. In discussing them, I may have seemed dogmatic, for while each might be the subject of several books, I have touched them but briefly. In essence, I have merely attempted to remind food producers of considerations they already know but often overlook—considerations which can tip the commercial scale toward success or failure.

FERRY CONTINUOUS POTATO CHIP MACHINE

is completely automatic! Automatic from raw, unpeeled potatoes to finished product. Peeling, slicing, washing, drying, frying and salting . . . all are under perfect control. You can't beat a Ferry Potato Chip Machine.

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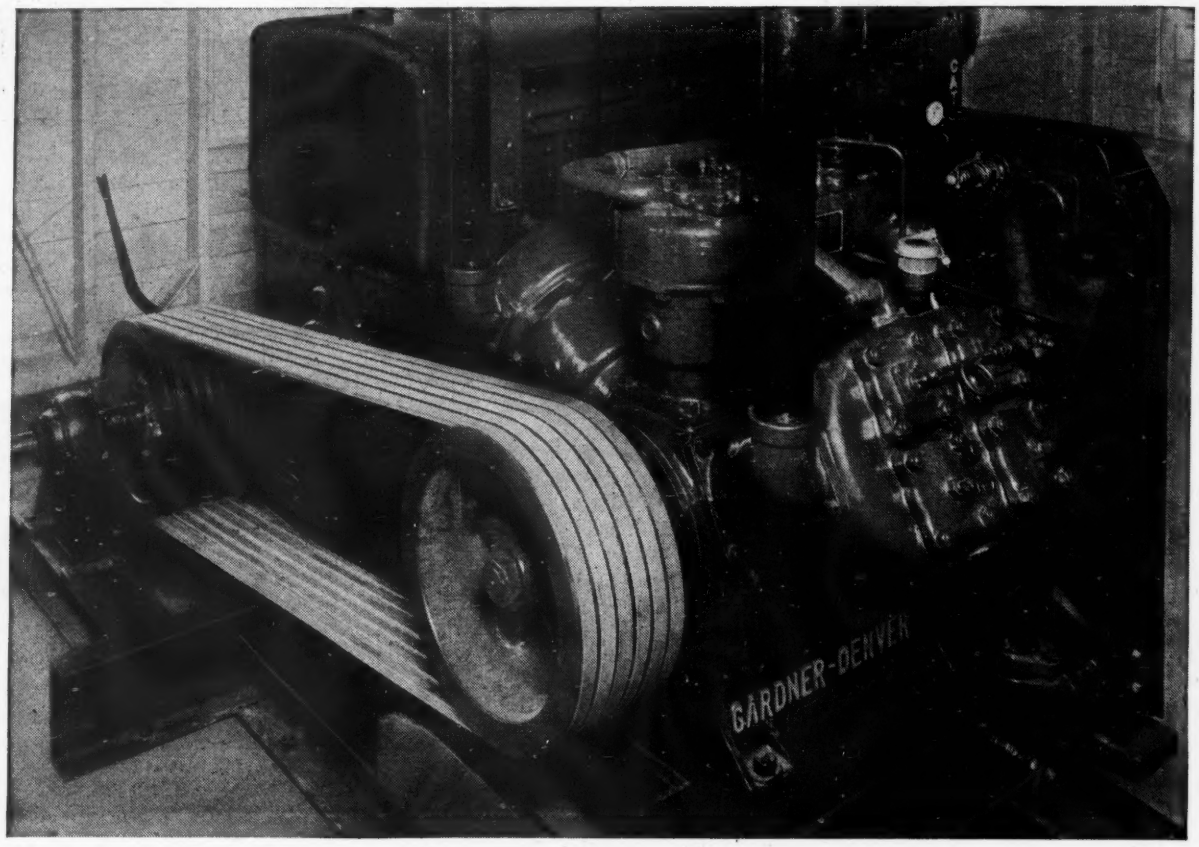
# What do careful buyers know about this "WB" Compressor?




It's an open secret among buyers that Gardner-Denver Class "WB" Air Compressors, though compact in size and rated as "small machines," develop efficiencies comparable to those of large two-stage horizontal compressors! In other words, *you get more air output in less space — and at low cost.*

The reason? Class "WB" compressors are a departure from conventional design. The use of two small water-cooled cylinders where one large one is ordinarily used results in lower air temperatures — saving in horsepower — considerably reduced inertia load. Other "WB" features you'll value are:

- ✻ *Combination radiator and air-cooled intercooler permits use where cooling water is scarce or of poor quality.*
- ✻ *Completely water-jacketed cylinders for maximum operating efficiency in any temperature or at any altitude.*
- ✻ *Silent "cushioned" Duo-Plate valves.*
- ✻ *Positive pressure system of lubrication from oil pump.*
- ✻ *Timken tapered roller main bearings.*

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